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SYDNEY, SATURDAY, OCTOBER 22, 1955

No. 17

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### Australasian Medical Congress (British Medical Association) SYDNEY, AUGUST 20 to 27, 1955

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## Section of Paediatrics.<sup>1</sup>

*President:* Kate I. Campbell, C.B.E., M.D., B.S., Victoria.

*Vice-Presidents:* P. A. Earnshaw, M.B., Ch.M., F.R.A.C.P., Queensland; R. A. R. Green, M.B., New South Wales; M. T. Cockburn, M.D., F.R.A.C.P., South Australia; R. H. Crisp, M.D., B.S., Western Australia; N. M. Newman, M.B., B.S., M.R.C.P., M.R.A.C.P., D.C.H., Tasmania.

*Honorary Secretary:* Dr. S. E. J. Robertson.

### President's Address.

KATE I. CAMPBELL (Victoria) took as the subject of her presidential address "The Care of the Unborn". She stressed the importance of the period of intrauterine life, and said that in order to prevent stillbirths and neonatal morbidity and mortality, the various forces at work in the prenatal period must be studied. The preconceptional health of the mother was of fundamental importance, as

her blood, extracellular fluid and tissues formed the environment of the fertilized ovum. Adverse factors which might influence that maternal environment could be classified as five in number—nutritional factors, oxygen lack, infection, metabolism and irradiation. Nutritional and metabolic factors might operate throughout the pregnancy and parturition, while the other three generally had an episodic incidence. Clinical experience suggested that Warkany's experimental work in producing congenital defects in the offspring of rats rendered deficient had its parallel in the human. The need for a good pregestational diet was obvious.

Dr. Campbell made a plea for discrimination in weight control during pregnancy. She said that mothers who,

<sup>1</sup>The meetings held by the Section of Paediatrics with the Section of Obstetrics and Gynaecology, the Section of Ophthalmology, the Section of Anaesthesia, the Section of Medicine and Experimental Medicine, the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine, the Section of Neurology and Psychiatry, the Section of Surgery, and the Section of Radiology and Radiotherapy have already been recorded.

through vomiting of pregnancy, had lost much weight and then began to regain it, were often erroneously regarded as gaining excessively and were put on a reduction diet, to their own detriment and that of the fetus.

Dr. Campbell went on to say that whilst the type and severity of the adverse influence were significant, the most important thing was the period of pregnancy at which it was exerted. The same factor at different times would produce different effects. From the point of view of that timing, prenatal life might be divided into three stages: (a) the first three months, the stage of organogenesis; (b) from three months to term, the stage of growth of the fetus; (c) the stage of birth. Adverse influences during the first stage produced arrest of development, maldevelopment or death of the fetus. The second stage was dominated by the placenta, as the function of that organ determined the destiny of the fetus. Placental insufficiency and the factors producing it were discussed, as also were the effects of abnormal sites of placental implantation and retroplacental hæmorrhage.

Dr. Campbell drew attention to the effect on the fetus of certain viral diseases contracted by the mother in the latter weeks of pregnancy. She said that such sick fetuses at birth might be mistaken for subjects of *asphyxia neonatorum* from obstetric causes. She stressed the prevention of prematurity as being more important than the treatment, and also discussed the dangers to the fetus of post-maturity. She said that during birth the dangers were anoxæmia, trauma and infection. She stressed the need for good ante-natal care in order to reduce obstetric catastrophes, and considered the influence of the mother's psychological state on the uterine contractions and thus on the well-being of the fetus.

In conclusion, Dr. Campbell emphasized the necessity for close liaison between physician, obstetrician, labour ward sister and pædiatrician. She said it was necessary, not only for the saving of individual baby lives, but also to ensure the adoption of the best procedure during pregnancy and parturition to produce a healthy newborn baby.

Dr. Campbell also showed slides illustrating the perinatal mortality in the two public midwifery hospitals in Melbourne.

#### Alimentary Disorders in the Neonatal Period.

##### *Vomiting in the Newborn.*

N. M. NEWMAN (Tasmania) discussed vomiting in the newborn, which he classified for convenience into obstructive and non-obstructive causes. He said that the obstructive causes included oesophageal atresia, cardio-oesophageal abnormalities, pyloric stenosis and pylorospasm, intestinal atresia and stenosis, malrotation and malfixation, meconium ileus, strangulated hernia and Hirschsprung's disease. The non-obstructive causes included infections, increased intracranial pressure, hypoproteinaemia, "irritative vomiting" and feeding errors. Oesophageal atresia presented as vomiting with choking and cyanosis and an excess of frothy mucus in the mouth. The cardio-oesophageal abnormalities included lax oesophagus and hiatus hernia, either the para-oesophageal or the sliding types. They all caused excessive vomiting, occasionally forcible and often hæmorrhagic. Dr. Newman described the differing features of pyloric stenosis and spasm. He said that babies with intestinal abnormalities, meconium ileus and strangulated hernia presented with early vomiting and the signs of intestinal obstruction. Hirschsprung's disease often presented in the neonate as vomiting and signs of intestinal obstruction without obvious cause. Spontaneous evacuations of the bowel, with intervening periods of normality and recurring symptoms of obstruction, followed until the typical picture of constipation, dilated bowel and characteristic radiographic findings developed. Of the non-obstructive causes, infection might be enteral or parenteral. The former type might be due to known specific pathogens or to bacteria whose aetiological relationship was suspect. The latter type included respiratory infections, *otitis media*, *pyelonephritis*, *meningitis*, *septicæmia* and *perinephric abscess*. Vomiting due to increased intracranial pressure always followed an

abnormal birth history, resulting in intracranial hæmorrhage, hydrocephalus or cerebral oedema. Hæmatemeses due to hypoproteinaemia was to be differentiated from that due to hiatus hernia, "irritative" vomiting, and blood swallowed from cracked nipples. Dr. Newman divided the feeding errors which caused vomiting into over-feeding, under-feeding with aerophagy, eructation of wind with regurgitation of milk, rumination, and difficulties with artificial feeding (unsuitable mixture, unsuitable amounts, and allergy). He suggested some investigations, not only special investigations, but a detailed analysis of the birth history, the vomiting and the feeding of the infant.

##### *Alimentary Obstruction in the Neonatal Period.*

DAVID L. DEY (New South Wales) read a paper on "Alimentary Obstruction in the Neonatal Period". He said that there had been a general improvement in the infantile mortality figures, but that was not reflected in those for the neonatal group. An important section of the latter group comprised cases of alimentary obstruction. A search of the records of the Royal Alexandra Hospital for Children over a seven-year period had uncovered 498 proven cases, of which 133 were fatal. That apparently fairly satisfactory result became most unsatisfactory if the cases of hypertrophic pyloric stenosis were excluded. It then appeared that 170 babies were admitted to hospital, of whom 131 died. Thirty-five of those deaths could be attributed to other severe defects or to prematurity.

Dr. Dey then enumerated the sites of the obstruction, together with the detail of the obstructing agent. He said that 63 of the 170 cases were associated with lesions of the oesophagus and anus, and hence should have been capable of easy and early diagnosis; that was not the case in practice. Improvement in the figures was likely to follow only early diagnosis and adequate treatment in an institution capable of undertaking the after-care of such tiny patients. That must be on a clinical basis, backed by plain radiographic examination of the abdomen. Dr. Dey gave a general outline of the problem and considered in more detail the various types of obstruction, mostly in regard to early diagnosis. He stressed the great importance of decompression of the distended loops of bowel above an anastomosis, and referred to the relatively high incidence of Hirschsprung's disease. He finally gave some indication of the line of action to be taken in a distant area.

##### *Discussion.*

Dr. Newman's and Dr. Dey's papers were considered together.

FELIX ARDEN (Queensland), opening the discussion on Dr. Newman's paper, asked that one word be altered. Dr. Dey had used the same word—to wit, they had both suggested the use of a soft rubber catheter in the diagnosis of oesophageal atresia in babies. Dr. Arden said that there was a risk that a soft catheter would curl up in the oesophageal pouch and thus cause the diagnosis to be overlooked. He agreed that there was difficulty in diagnosis on many occasions in cases of incomplete obstruction from malrotation of the gut. They were much more difficult to diagnose than cases of complete obstruction, as they tended to have some days on which no vomiting occurred, and on such days X-ray investigation might give negative results. It was a help in such cases to weigh the baby daily, as a steady decline in weight was often one of the most convincing signs that something was seriously amiss. Dr. Arden said that he would have liked Dr. Newman to add to his list of causes of vomiting excitability from over-stimulation, which was found in the type of baby who was said by his mother to be vomiting all the time, but who in fact looked very well. A baby of that type was often a first child or even a first grandchild and responded well to sedation.

R. T. GRANT (South Australia) said that pyloric tumours were best felt when the baby had vomited. Even so, it was not always easy to feel the tumour; and if the child was losing ground, it was safer to operate. He stressed the frequency of neonatal sepsis as a cause of vomiting, and the importance of not overlooking such conditions as



paronychia. They were never to be taken light-heartedly. Sometimes a mistaken diagnosis of pyloric stenosis was made in those cases.

JUNE PASH (Victoria) referred to the common association of oesophageal atresia with hydramnios in the mother and suggested that all babies of mothers suffering from hydramnios should have catheters passed down the oesophagus shortly after birth to exclude the condition.

MURRAY CLARKE (Victoria) praised the refreshing frankness of Dr. Dey's presentation of the surgical position in the newborn, and predicted that at the next meeting figures would be much better. It surprised him to find the mortality rate so high, particularly in easily diagnosed conditions such as oesophago-tracheal fistula and imperforate anus. Although it was evident that improvement could come chiefly from earlier diagnosis, he considered the supportive treatment most important in cases of intestinal obstruction. Dr. Clarke felt that babies were relatively neglected in that way compared with adults, particularly in relation to such conditions as potassium deficiency, and he considered that a physician who was an expert on electrolytes should be called in for the treatment. Newborn babies after such severe operations might well be nursed in "Isolette" cots, where they had no weight of blankets on them, were spared from infection and received the careful attention of a single nurse. Earlier diagnosis would be obtained if doctors were willing to have X-ray pictures taken earlier, if necessary after air had been instilled into the stomach to dilate it and the duodenum. Dr. Clarke asked whether Dr. Dey had had any experience of the use of 3% hydrogen peroxide solutions in meconium ileus. Someone had recently stated that that caused babies to pass casts and pellets with subsequent defatation. He had had only one case of his own, which was unsuccessful. In his experience babies with low intestinal atresia did better than babies with high atresia. He had been using a technique of intestinal clamping and subsequently closure of a gun-barrel ileostomy.

KATE CAMPBELL (Victoria) said that she did always pass a catheter on babies from hydramnios labours. It was helpful to test the reaction of all aspirated fluid. If it was strongly acid, it must have come from the stomach. She referred to the condition of gastro-intestinal dyskinesia and said that the symptoms were variable; sometimes those children were operated on unsuccessfully, or, at least, the surgeon could find no cause for the intestinal stoppage. Dr. Campbell agreed with Dr. Clarke about supportive treatment, but stressed the importance of avoiding drowning the baby by giving too much fluid. Newborn babies required only half to three-quarters of an ounce of fluid per pound of body weight on their first day, three-quarters to one ounce per pound on the second day, one to one and a quarter ounces per pound on the third day, and one and a half ounces per pound on the fourth day. They were often given too much.

Dr. Newman, in reply, said that he had included the hyperexcitable infant under his pyloric spasm cases. He regarded pyloric spasm as a somewhat doubtful entity.

Dr. Dey, in reply, agreed that the babies with incomplete obstruction were always a problem, and because of that often did worse than those with complete obstruction. He thought that plain X-ray films offered the greatest help. He thanked Dr. Clarke for his remarks, and mentioned a recent paper of Gross, who was treating atresias by exteriorizing them, then immediately putting crushing clamps on the spur and closing the opening in a few days. He agreed about the importance of supportive therapy, provided that amateurs did not play with electrolytes before sending the child to hospital. He had not yet used hydrogen peroxide in cases of meconium ileus.

#### Clinical Features of Children Suffering from the Effects of Icterus Gravis Neonatorum.

CLAUDIA BURTON-BRADLEY (New South Wales) read a paper on the clinical features in children suffering from the effects of Rh-isosensitization. She traced the historical development of hæmolytic disease of the newborn to present-day concepts of what was now known to be one

disease entity with its basis in the serological, hæmatological and genetic evidence of parental Rh incompatibility. She said that formerly that had been regarded as three distinct conditions—*hydrops fetalis*, anaemia of the newborn, and *icterus gravis neonatorum*, and recounted the introduction of the terms "*hydrops fetalis*", "*kernicterus*" and "*erythroblastosis*".

Dr. Burton-Bradley said that her paper had three objects: (a) to draw attention to the syndrome which occurred as sequelæ in some children who had survived *icterus gravis neonatorum*; (b) to reiterate that while transfusion had saved some lives, which without it would have been lost, those permanently affected by the selective cerebral damage were severely handicapped; (c) to emphasize the difficulties facing such a child and to establish that for some affected children it would appear that they were not entirely insurmountable. Dr. Burton-Bradley reviewed 18 cases. All the patients had presented to the Spastic Centre (New South Wales) out-patient department suffering from varying degrees of slowness in the acquisition of sitting, standing, walking and speech. All attended the centre on a daily basis for education and treatment. All the children had been jaundiced; 14 had received transfusions, four had not. The time of initial transfusion varied from the day of birth to three weeks. All the mothers were Rh-negative; 17 children were Rh-positive. One, by repeated checking, was Rh-negative, but was erythroblastic, and antibodies were present in the maternal serum.

Dr. Burton-Bradley described eight cases in detail, giving birth and family histories and, when it was available, the neonatal history. She said that those cases emphasized similarities and differences in clinical findings. The common clinical findings were emphasized. They were: athetosis and, if the child was walking, a specific pattern of gait referred to as "toe-heel", which was considered to be due to the athetosis, as the heel cords were not shortened; frequent torsion of the tibiae, *genu recurvatum* and increased lumbar lordosis; hypoplasia of the enamel with "Rh hump" of deciduous teeth; deafness with the greatest loss in high-frequency sounds; and defective upward eye motion. Seventeen patients were athetoids; one, born after labour induced at thirty-six weeks, was spastic. Dr. Burton-Bradley commented on the discrepancy frequently found in the estimation of intelligence quotient and learning ability. She gave tables of the following: (i) birth data, including onset and period of jaundice and time of transfusion; (ii) blood grouping and serological investigations; (iii) Rh family history; (iv) general clinical findings; (v) hearing loss; (vi) electroencephalographic investigations. She also showed four selected audiograms typical of the high-frequency deafness found in those children.

W. G. MCBRIDE (New South Wales), in opening the discussion, inquired how many of Dr. Burton-Bradley's patients had been given exchange transfusions.

F. ARDEN (Queensland) asked whether any post-mortem examinations had been performed on children aged over two years suffering from the after-effects of *icterus gravis* and, if so, what degree of cortical damage such children showed.

S. E. J. ROBERTSON (New South Wales) said that he could not recollect seeing any children who suffered from convulsions after recovery from *icterus gravis*. The textbooks reported that, and he wondered whether Dr. Burton-Bradley had seen any.

ELIZABETH TURNER (Victoria) said that she was surprised that no correlation had been found between the duration and severity of the jaundice and the subsequent clinical picture. She felt that there was a strong association between the two. She stressed that the early lesion of kernicterus was probably a vascular one and capable of reversal by early exchange transfusion.

Dr. Burton-Bradley, in reply, said that the children in the series she had described were older, and none had received exchange transfusions. She had a new series of 35 children with six exchange transfusions, but those were

younger and the series was not yet fully analysed. She had no personal experience of the findings at post-mortem examination on children aged over two years. In reply to Dr. Robertson, Dr. Burton-Bradley admitted that only one of her present series of 18 children suffered from convulsions, and as he was spastic and not athetoid, he possibly had cerebral damage from some other cause. To Dr. Turner, Dr. Burton-Bradley said that her children gave histories of jaundice lasting from two weeks to three months; but she had no details of the intensity of the jaundice or of the child's illness at that time.

KATE CAMPBELL (Victoria), from the chair, thanked the speakers and said that she had enjoyed the film, which impressed one with the great importance of effective treatment at the earliest stage. She had been interested to hear that six of Dr. Burton-Bradley's 18 patients had been born prematurely, for prematurity provided an additional hazard, favouring the development of kernicterus. She felt that there was a relationship between the duration of jaundice and the severity of the symptoms. Nowadays no baby was allowed to remain jaundiced for more than five days, whereas in that series some had been jaundiced for as long as three months. Dr. Burton-Bradley's work emphasized the value of prospective rather than retrospective studies. Perhaps so few post-kernicterus babies were seen with convulsions because virtually all such infants soon died.

#### Electroencephalographic Evaluation of the "Cerebral Palsied" Child.

E. L. DAVIS (New South Wales) read a paper entitled "An Electroencephalographic Evaluation of the 'Cerebral Palsied' Child and its Help to the Clinician". He based his remarks on the results of 850 electroencephalographic examinations performed at the Spastic Centre over a period of eighteen months. He said that, although the clinicians could diagnose, and often localize with fair accuracy, brain damage in the child suffering from cerebral palsy, yet those conducting the electroencephalographic examinations were learning as they proceeded, and eliciting facts which had helped the clinicians in their management of the children. It should be remembered that electroencephalography was a painless procedure. Dr. Davis then discussed the clinical classification of the cerebral palsies in use at the Spastic Centre, their etiology, variations in the clinical picture, and the pathological background. He said that from the point of view of diagnosis the electroencephalogram was useful in four ways: (i) in the diagnosis and localization of cortical abnormality, with particular reference to the advisability of surgical interference; (ii) in the diagnosis of epilepsy and its variants; (iii) in the recognition of the potentially epileptic child; (iv) in the aid it gave to the clinician in determining the leading hand in rehabilitation. With regard to prognosis, Dr. Davis said that all children whose electroencephalograms showed diffuse cortical damage, *petit mal* variant, epilepsy patterns and diffuse  $\beta$  patterns had proved resistant to all forms of treatment. From the point of view of treatment, the electroencephalogram had proved especially useful in directing the specific drug therapy of the epileptic, and perhaps as a note for the future, in aiding the surgeon in the excision of epileptogenic foci.

L. R. RAIL (New South Wales) agreed that the electroencephalogram was of great help in deciding the nature of the lesion, provided one remembered that the abnormalities found were physiological, revealing both localized cortical abnormalities and more diffuse ones which were epileptic. Thus the lesion might be much smaller than the area apparently involved. Both anticonvulsant drugs and the passage of time tended to bring about improvement. Many patients in the choreo-athetoid group showed electroencephalographic changes associated with cortical damage. That had been confirmed by autopsies, but did not necessarily mean a diminution of intelligence. Surgery in the treatment of epilepsy was rather disappointing, 50% of patients failing to improve; but there might be a future in hemispherectomy, especially in the treatment of spastics. It must always be remembered that the electroencephalo-

gram was only one diagnostic weapon and must be correlated with all other sources of information.

#### So-Called "Acidosis Attacks" in Children.

FELIX ARDEN (Queensland) read a paper on so-called acidosis attacks in children. Under the title of "cyclical vomiting" he discussed the case histories of 10 children, each of whom suffered attacks characterized by one or more of such symptoms as headache, vomiting, abdominal pain, nausea, pallor, fever, prostration and visual disturbances. Dr. Arden drew a distinction between the expression "acidosis", used in the past to describe these attacks, and "ketosis", and considered the biochemical background; the conclusion was that the essential physiological disturbance in those attacks was still a mystery.

Dr. Arden sketched the clinical picture in some detail, to indicate its variability in different children and to emphasize that the concept of the disorder must include mild recurring episodes as well as the severe attacks which were accompanied by severe ketosis and dehydration. He said that diagnosis depended upon careful history-taking, as the child was often well when examined. In many instances a particular family background was revealed. Recurring episodes of organic disease and such conditions as intracranial neoplasm needed to be carefully excluded.

Dr. Arden then discussed various possible aetiological factors, such as recurring infections, allergy and emotional stress, and also the grounds for regarding the attacks as being due to fat intolerance; but he concluded that the relationship of migraine to cyclical vomiting was the most important factor. He quoted case histories to emphasize that relationship, and made the claim that cyclical vomiting could really be regarded as the juvenile form of migraine, usually regarded as an adult disease. Dr. Arden finally described the management of the attacks and of the parental attitude to them.

LORIMER DODS (New South Wales) said that the older he grew, the more frightened he was of making a diagnosis of "cyclic vomiting", and the more conscious he was of the painful clinical limitations which could follow such a diagnosis; but he was acutely aware of the existence of that condition, and had once practised in an area where the disease seemed to be endemic and where the type of child defined by Dr. Arden seemed to predominate.

Professor Dods agreed with Dr. Arden about the ketonuria which might precede any vomiting, and pointed out that the ketonuria might be of considerable degree at a very early stage. Many of the children were surprisingly, almost "unnaturally", well just before the onset of an attack, and some of the mothers were able to predict an attack in that way. In Professor Dods's experience, the "attacks" usually began towards the end of the day rather than on waking, and the children were usually aged about three to five years at the time of their attacks. He had noticed that those children suffered short attacks of what might be defined as "overtiredness", which were characterized by pallor, "dark rings" under the eyes and some degree of prostration. The attacks were not accompanied by vomiting or any obvious abdominal pain or headache, and possibly had something in common with the reactions to stress which Dr. Clements had described at an earlier meeting of the Section of Paediatrics.

Professor Dods pointed out that if several attacks suggesting "cyclic vomiting" were observed and if no organic cause could be found, then it might be reasonable to accept that diagnosis; but it was most important that each new episode should be approached with an open mind and not with the satisfied and complacent feeling that it was "just another attack of cyclic vomiting".

H. BOYD GRAHAM (Victoria) said that Dr. Arden had not hesitated to use the term "migraine", which was common in the family history of the children under discussion, and admitted that "acidosis" was not an appropriate label, as it had an accepted meaning in another connotation. Dr. Graham asked why the condition should not be called "migraine in children". He thought that to do so would

be to help clinicians to outline management (a term which he preferred to treatment in the circumstances). It was desirable that the psychosomatic technique should be adopted. The familial and environmental details should be noted carefully and evaluated. Attempts to remove provoking factors usually helped. The home management of the episode must be described to the parent by the doctor. Persistence with simple but sound feeding was needed. Therapy might be directed, as in adult migraine, to checking over-activity of the voluntary and autonomic nervous system, but should not be relied on as the chief contribution of the doctor to the cure of the patient.

M. T. COCKBURN (South Australia) said that the parents sometimes took affected children to a specialist because they were not happy and wanted to be reassured, and because the family doctor might not be correlating the recurrent attacks, but treating them as isolated instances. Dr. Cockburn agreed with the principle of viewing each new attack with an open mind, and recalled being deceived by infective hepatitis. In his experience also the condition was most common in the two to six years age group. He had found that if cow's milk was completely eliminated from the diet of such children for some months, they mostly improved and some became quite well.

D. C. HENCHMAN (New South Wales) asked whether, in view of the association with migraine, anyone had tried ergotamine tartrate therapy.

R. K. DOIG (Victoria) said that he was interested in the association between cyclic vomiting and migraine. Not only the clinical features but also the type of child corresponded. A family history of migraine in the parents of children affected by cyclic vomiting was very common, and suggested either a genetic factor or an unconscious mimicry of the parent's disabilities by the child. Dr. Doig pleaded for more positive therapy than mere acceptance of the disorder.

R. W. MITCHELL (New South Wales) said that he had used ergotamine tartrate in the management of such attacks on two occasions, with relief.

Dr. Arden, in reply, said that he had no personal experience of ergotamine tartrate in juvenile migraine. He agreed that more positive therapy than mere acceptance of the disorder was called for. One should endeavour to readjust the lives of affected children and to remove stress whenever possible. In addition to the actual treatment of the attacks, the administration of phenobarbital or chlorpromazine in small doses over a long period seemed to lessen both the frequency and the severity of the episodes.

#### Visiting in Children's Wards.

J. C. FULTON (New South Wales) discussed "Visiting in Children's Wards". He said that the subject was not a new one, and referred to the literature of 1772, when it was stated that the reception of infants into hospital was impossible because the consequent separation of children from their parents would "break the heart" of the child. It was now held by a large number of paediatricians and child psychiatrists throughout the world that for normal mental health in later life it was essential that there be a warm, intimate, continuous relationship to the mother or permanent mother-substitute in the early years of childhood. In the under-five years age group deprivation of the affection of the child's parents and the security of his home surroundings could lead to such a loss of security that permanent mental damage ensued. Such deprivation occurred when children were admitted to hospital and received only occasional visits from their parents. The ideal was the prevention of parent-child separation by the retention of the sick child in the home or by the admission of the mother to hospital with the child. It was pointed out that there was a trend towards more home care of the sick child, owing to the training of larger numbers of doctors in paediatric care, and that some hospitals were conducting successful home treatment services.

Dr. Fulton went on to say that there were numerous occasions when young children had to be admitted to hospital, and many hospitals throughout the world were

arranging for mothers to visit their child daily and take part in his nursing. However, some centres either were not enthusiastic or were opposed to daily visiting by parents. Daily visiting had been introduced into some wards of the Royal Alexandra Hospital for Children over the preceding twelve months. Difficulties encountered had been the obsolete design and excessive size of the ward units, resulting in a "too busy" sister-in-charge, who was unable to supervise free visiting by mothers properly; there was also a need for educating parents, resident medical staff and nursing staff in the reasons for maintaining a close mother-child relationship, and for educating the mother in how to "mother" the child in hospital rather than visit him in the ordinary way. In smaller ward units—for example, 14 and 19 bed units—experiences had been very satisfactory and showed that, with good understanding on the part of the mother and the nurses, the usual difficulties in the home and in the hospital were successfully overcome. Dr. Fulton, in conclusion, pointed out that beneficial side-effects of the daily presence of mothers in children's wards were the availability of information from the parent, the educational effect on the resident medical officers, who had a much greater contact with the parents, the development in parents of confidence in the hospital and its staff, and a humanizing influence on the ward atmosphere.

KATE CAMPBELL (Victoria), in opening the discussion, said that, as the effects of unrestricted visiting were most evident to the nursing staff, she had arranged for Miss Marian Ievers to attend and address the meeting. Miss Ievers was a senior sister on the staff of the Queen Victoria Hospital, Melbourne, where unrestricted visiting had been the rule for the past eight years.

MISS MARIAN IEVERS (Victoria) said that about eight years earlier she had taken charge of the sick children's ward in the Queen Victoria Hospital. There, free visiting not only by parents, but by friends, was allowed. It had not been necessary to ration the visitors—it was found that they did that themselves, and the ward was never overcrowded with the whole day and even the night available for visiting. The number varied from one to five; seldom was there no one present. The visitor sat with the child, if the condition permitted, nursed him, played with him, fed, changed or bathed him, and in general performed any parental duties. Miss Ievers found that visitors cooperated in regard to food and sweets. At first supervision of hygiene might be necessary. If the parent was reliable, he or she might assist with simple procedures. If it was necessary for the child to be held, the parents were permitted to do so; he gained confidence from their presence. To the sick child with the flagging appetite, even the best hospital food might not appeal. A well-equipped auto-tray donated by an appreciative mother was in readiness for the parent to prepare a meal she could eat with the child if desired. The parents knew their own child and could give valuable help in preparing the food to which he was accustomed.

Miss Ievers then said that as far as was possible parents were encouraged to reproduce the normal atmosphere of the home in the ward, with the customary story, song, kiss and prayers at bed-time. On admission to hospital, if the child was old enough to understand, it was explained to him that he was coming to hospital to be made well. Some regarded that as an adventure, and some were distressed. The younger child understood only that he was taken from his mother and abandoned to strangers in a strange world. By many it was thought that the child who showed no outward signs of distress did not mind being left; but that of course was not so. A well child who was admitted to hospital for operation was confined to bed for convenience; the normal child found that irksome. Miss Ievers said that the procedure that they had found best was for the parent to stay for the next meal if possible and settle the child to sleep; a sedative was given if thought advisable. The child was told that mother was going home but that she would return. Some parents were upset if the child cried when they left; but they were assured that a normal child from a good home should



cry and it was a good idea if they could wait and view him from a vantage point. In the case of booked operations it had been found a good idea to have someone with the child during the period of fasting and to assure him that his mother would be there when he awakened.

Miss Ievers went on to say that they believed that unrestricted visiting was good for the child, the parents, the medical officers and the nurses. With regard to the benefits to the child, he was secure. The child who was away from the family for any length of time lost his place there. Parents were encouraged to bring other members of the family to the door to wave and chat. A child being treated for tuberculous meningitis was dressed in her own clothes and taken home or to the beach or gardens by her parents and later returned happily to the hospital. When the visitors came at different times and left at different times, an upset child could have individual attention.

Discussing the benefits to the parents, Miss Ievers said that they gained confidence and the strain of parting was lessened. She had heard parents ask: "Can we see him if we pay?" That was not a privilege extended to private patients and was appreciated. They saw the treatment the patient received—nothing was hidden. They learned to carry out simple treatments. After they had been working with the staff, in many instances their hygiene improved and it was thought that many homes benefited from the experience. The over-anxious parents were helped to get a better perspective; usually someone was worse off than they were. Mistakes in handling could be observed and the mother could learn how to handle the child in a more sensible manner, realizing that her fears were groundless. The type of parents who "dumped" their children and evaded their responsibilities had it made clear to them that their help was expected and that their responsibility did not end when they left the child in hospital. Invariably their interest was stimulated by helping and seeing the work done. The parents of the child with an incurable condition found their sadness lessened by knowing that they might spend all the time they wished with the child, and their burden was lightened by being able to talk to an understanding staff. The parents watched all procedures with a very close eye, and had at times pointed out errors and possible improvements which would otherwise not have been brought to notice. Their criticism was usually constructive. Traditional visiting hours were awkward. For the mother, the middle of the afternoon, with the children returning from school, the evening meal to prepare, and the family bed-time, was most inconvenient. For the father they meant time off from work or no visiting at all.

Discussing the benefits to nurses, Miss Ievers said that trained staff who had worked under a different régime were enthusiastic. The nurse was able to visualize the child in the family setting, not merely as a little patient in a hospital bed. Free visiting did away with the deplorable habit of "getting ready for the visit". The academic knowledge of how to handle a sick child became lessened by the humanitarian approach. The nurse learned that the patient came first; she learned to listen sympathetically and to help the parent as well as the child. All that was a direct benefit to the patient and a good training in human relations. The atmosphere was a happy one.

Miss Ievers then set out the benefits to the resident medical officers. She said that it had recently been pointed out to her by a member of the administrative medical staff of the Queen Victoria Hospital that experience gained by resident medical officers in the children's ward in handling parents of patients was useful in their work in other departments. They more readily assessed the parents' worth and were less likely to blame them unnecessarily.

Referring to the benefits to the sister, Miss Ievers said that real nursing satisfaction was experienced in sharing responsibility with the parents for the well-being of the child. Having experienced both systems, she would not accept a position in a children's ward where free visiting was not allowed. The routine work of the ward was lightened and instead of interviewing 30 to 40 people in

one short hour, one was able to give them individual attention.

Miss Ievers then went on to discuss the disadvantages of the system, of which there were invariably some. There were constant interruptions; but they should be regarded as part of the service. There could be only one charge sister; but all hospitals had staff nurses who assisted in the administration of the ward. A notice was placed on each bed explaining the need for the parent's cooperation, and stating that questions and criticisms were to be addressed to the sister. Miss Ievers said that all those present knew the type of patient who played one hospital and one doctor against another, and who criticized doctor to nurse and nurse to doctor. She thought it was much better to have that kind of criticism than that in which the mother said: "I rang the hospital and I got no satisfaction. I was not allowed to speak to the sister or the doctor; they wouldn't let me see him and now it's too late."

In conclusion, Miss Ievers said that it would be impossible for a ward sister to make the system work successfully without the encouragement, cooperation and guidance of senior medical officers and the matron.

H. McLORINAN (Victoria) emphasized that unrestricted visiting was also practical in infectious diseases hospitals. He said that since he had introduced it three and a half years earlier no member of his nursing staff had asked to go back to the old ways. Dr. McLorinan referred to the late Sir James Spence's practice of asking parents to come in and help with the nursing, which was so important to the child. That was a further extension of the same idea.

LORIMER DODS (New South Wales) said that Dr. Fulton's sympathetic and understanding approach to the very important aspect of hospital administration under discussion had helped to make the introduction of free visiting very easy in his own ward. Professor Dods and his staff had observed free visiting in his ward over the past four or five years, and they had all been impressed by the success of the procedure. Admittedly his ward was a small one, and the sister in charge was particularly understanding and anxious to encourage regular visiting. Professor Dods had been most impressed by the occasional glimpse of the sick child's social and emotional background and the valuable extra information which had been added to history sheets as a result of that daily contact and conversation with the parents.

CLAIRE ISBISTER (New South Wales) thanked Miss Ievers and said that she hoped her remarks would be published in full. Dr. Isbister needed them to influence her own nursing staff.

Dr. Campbell, from the chair, said that the size of the ward was no real obstacle. Miss Ievers's ward held 30 to 40 children and was very well run. It was better to have visiting free at all times, not on a roster system, as mothers could not run their own homes that way. Dr. Campbell said that she encouraged parents to help with their children's treatment, and quoted the case of an Italian father whose child was very ill and extremely hard to feed until they allowed his own home-cooked dishes to be brought. After a successful day's parental feeding the father added up the child's feeding chart and was heard to remark: "Sixteen ounces! Whacko! Now I can go and have a fag." Dr. Campbell felt that no responsible person in her hospital would go back to the old scheme.

#### Epidemiology and Control of Staphylococcal Infections of the Newborn.

PHYLLIS M. ROUNTREE, D.Sc. (New South Wales), presented a paper on "The Epidemiology and Control of Staphylococcal Infections of the Newborn". Dr. Rountree stated that staphylococcal infection of the newborn in hospital nurseries occurred at two levels: (i) the sporadic infections present in all hospitals; (ii) epidemics due to particular strains. (i) The sporadic infections were the consequence of the bacterial contamination of any hospital environment. Phage typing showed that many strains caused those infections and that the same diversity of strains was found in the noses of the hospital staff.



(ii) Epidemics of infection due to one particular strain had occurred throughout Australia in the past two years. It was a new strain of high virulence and infectivity, and also caused breast abscesses in mothers of infected babies and epidemics of recurrent furunculosis in the general community. It was penicillin-resistant. The control of both types of infection depended on the fact that their reservoirs were the nasal carriers in the hospital staff. Various kinds of antibiotic ointment could be used in attempts to cure these nasal carriers. In a recent trial the staff of a hospital used "Neotracin" ointment in their noses for a week. That procedure removed the nasal staphylococci from 70% of the carriers and was accompanied by a considerable decrease in the incidence of infection in the babies. It was suggested that further trials should be made of other types of ointment for that purpose, only those substances that would never be employed for parenteral therapy being used, in order to obviate the consequences of the development of resistant strains.

W. J. STEVENSON (Victoria), in opening the discussion, said that Dr. Rountree had made a valuable contribution to work on staphylococci by setting up a phage-typing centre in New South Wales. In his own country hospital in Victoria, where there were many sources of infection, such as common bathing tables, he had resorted to treating all contacts in the nursery in order to clean up outbreaks. Dr. Stevenson asked about the wearing of masks; he said that he was afraid the Medical Research Council recommendations on that subject were no more than a pious hope.

J. P. E. O'BRIEN (New South Wales) wondered whether the cooler autumn weather rather than the specific measures adopted accounted for the decline in the number of cases shown in Dr. Rountree's charts. Dr. O'Brien asked whether it was recognized that *miliaria rubra* was also a staphylococcal disease.

GRACE CUTHBERT BROWNE (New South Wales) spoke of the local administrative pattern, which had been developed over the past three years, for control of staphylococcal infections. She circulated for information copies of the recent edition of a booklet on the care of the newly born, the routine departmental procedure for contact with medical practitioners and the Staphylococcal Research Laboratory, a typical letter of contact after inspection, and an extract from the *Private Hospitals Act* indicating nursery standards. Dr. Cuthbert Browne pointed out that as the disease was not notifiable, information concerning epidemics was not comprehensive. Information was received either directly from the medical practitioners or hospitals, or indirectly from baby health centre sisters or the supervisory nurses inspecting private hospitals and training schools. Notification was seldom received from paediatric specialists, as they were often reluctant to notify the department, that appearing to be the duty of the medical practitioner in charge of the case. Without legislative authority, action depended entirely on the goodwill between the department and the medical profession. When the information had been received indirectly, difficulty in contact had been experienced only on one occasion; the reaction usually was a feeling of active and welcome cooperation.

Dr. Rountree, in reply, said that masks were very seldom properly used. When they were introduced into her hospital the infection rate rose. Whether they were indicated in premature baby nurseries was a matter for debate. In reply to Dr. O'Brien, Dr. Rountree said that the weather was still hot and humid, favouring the growth of staphylococci, during the week of the abrupt fall in the infection rate that followed the treatment of carriers.

#### The Medical Practitioner's Responsibility for Dental Health in Children.

N. E. GOLDSWORTHY (New South Wales) read a paper entitled "The Medical Practitioner's Responsibility for Dental Health in Children". He said that owing to the

unique nature of dental enamel, prevention of disease was the sole method of maintaining anatomical and functional integrity of the teeth. The principal disease affecting the enamel was dental caries, which was one of the great medico-social problems of the day, since it had a prevalence of virtually 100% in Western civilization. Caries occurred only if microorganisms and suitable substrates were simultaneously present in close contact with enamel. The microorganisms of the mouth constituted an infinitely complex and variable flora which could never be eliminated under normal conditions of life; but foods could be so chosen that effective interaction between them and the flora to produce acid or other agents destructive to enamel would be prevented or minimized.

Dr. Goldsworthy said that the desirable result depended on the development of enamel which was structurally sound, and the development of safe dietetic habits by restricting refined carbohydrates, especially sugar, and the limitation of the use of refined carbohydrates to three meals. Sound structure seemed to depend on correct nutrition during the developmental phases of the prenatal and preeruptive periods. Proper nutrition and dietetic habits could be attained only by instructing the people; and that could be done only by the medical profession and its auxiliary organizations, who had the contacts with the expectant mother. The requirements were that the prospective parents must be in good health, expectant mothers should have a diet rich in protein and the calcifying factors and restricted in sugar, infants should have sufficient protein and plenty of fresh fruits and vegetables, and should have their refined carbohydrates strictly limited, and children should be trained to take three meals with no in-between nibbling.

H. L. CARRUTHERS (New South Wales) referred to work performed in 1942 and 1943 for the Director of the Dental Hospital, Liverpool, with the help of the Medical Research Council of the Privy Council and the University of Liverpool. That had formed a small part of a long-term survey of the teeth of more than 200 children correlated with a careful nutritional survey made by Miss Grant and a team of nutrition workers from King's College, London. The bacteriological team consisted of one dental surgeon, who was the senior lecturer at the Dental Hospital, a technician, and a medical bacteriologist (the late Professor Hedley Wright) on loan from the Department of Bacteriology.

Dr. Carruthers said that 122 children were examined with the aim of determining the use of lactobacilli as an indicator of early caries—for example, superficial erosions in the enamel. Of the 122 children, 26 were found to have no caries, and lactobacilli were present in two. Mild caries was present in 72, of whom 11 harboured lactobacilli, and severe caries was present in 24, of whom three harboured lactobacilli; that meant that 14 of the 96 children harboured lactobacilli. The degree of caries was determined with considerable care by the senior lecturer in dentistry. Lactobacilli occurred twice as frequently when carious teeth were present, and twice as frequently in the presence of mild caries (the group in question) as in the absence of caries. Individual counts of lactobacilli showed no correlation with the amount of caries, for on occasions a high count might be obtained in a case of mild caries and a low count in a severe case. The number of lactobacilli in each specimen was determined by multiplying the count for one cubic centimetre by the total volume collected. Much bench work was carried out beforehand in working out the careful technique for counting and modes of collection of saliva specimens adopted by the dental team member. Dr. Carruthers said that it would seem sufficient only to take a constant inoculum of saliva after an adequate collection drill and to place it directly on tomato-agar without attempting actual counts of lactobacilli.

Dr. Carruthers said that if lactobacilli were found in the absence of caries, a careful examination of all enamel surfaces should be made. There could be no guarantee that of the 26 children selected as free of caries, the two with superficial erosions were without some missed and

small erosion, for the exposed enamel surface was large and the crevices were many. Moreover, some limitation of detection must be admitted by reason of lighting, the nature of the mouth and the observer's visual acuity. The method used for removing plaques and freeing crevices must be thorough. Forcible rinsing with saliva between the teeth was essential and a broth supplement might be helpful for dry mouths. Much use was made of a dental scraper, and the state of the gums was recorded. The presence of lactobacilli in a mouth otherwise regarded as free of caries might possibly be an indication for another observation by the dentist in charge of the patient.

R. GREEN (New South Wales) suggested further investigation of breast-feeding of babies, which should, in theory at least, lead to better development of the jaw, better spacing of teeth and therefore less caries. Dr. Green said that he had noticed that the child with the well-developed, rounded jaw and the low, broad palate did best. On the subject of diet he entirely agreed with Dr. Goldsworthy.

F. W. CLEMENTS (New South Wales) said that Dr. Goldsworthy had drawn attention to a task that could be effectively performed by the doctor. No one would dispute that. The real need was to define how it was to be done. A useful guide could often be obtained from history. The best analogy was in the development of infant feeding techniques in Australia in the early decades of the present century as the control measure for the high infantile mortality rates. Then satisfactory feeding techniques were evolved and a system of teaching them to mothers was expanded to meet the needs of the community. In that respect actions by the mother were positive, in line with strong motivation.

Dr. Clements went on to say that if that technique was applied to dental health all motivation of good dental health for its own sake had to be lifted to a much higher level than seemed to exist at the moment; a direct positive programme for the parents must be developed. That must be sold to the doctors. Dr. Clements said that without appearing pessimistic, he doubted whether those requirements had been produced by the dental authorities; there was some doubt whether a strongly positive motivation in that field could be found. The present advice was negative, on the lines of "don't do something" and "something might happen". The achieving of positive motivation might be difficult in the presence of a completely apathetic community attitude towards caries.

NORMA KELSO (Victoria) endorsed Dr. Clements' remarks and suggested an approach by publicizing the ill effects of not having teeth. She said that many lay people were quite happy about having them all out. Dr. Kelso wondered what nose and throat surgeons felt about the effect of total extraction on the maxilla, which must subsequently become reduced in size.

KATE CAMPBELL (Victoria) suggested that if frequent contact of the teeth with food was harmful, then members of Congress were not practising what they preached. She wondered how poorly fed Asians avoided dental caries so well.

Dr. Goldsworthy, in reply, said that he was not very satisfied with the lactobacillus counts, though they were using the method constantly at the Dental Hospital, especially as a check on the patient's adherence to his diet. He agreed that breast feeding was desirable, although perhaps it did not help the jaw. Rats fed entirely by stomach tube developed jaws equally as good as those of controls. He agreed with Dr. Clements that it was the responsibility of medical people to do something before the baby's teeth erupted and decayed. The disadvantages of having no teeth were considerable, and many people were not sufficiently concerned about it. It limited dietetic habits, besides causing facial distortion and trouble with ill-fitting dentures. Asians, though often on an inadequate diet, were generally not subjected to deleterious substances in their food.

#### Kernicterus: Its Prevention and Treatment.

ELIZABETH K. TURNER (Victoria) read a paper entitled "Kernicterus: Its Prevention and Treatment". She said

that kernicterus was a condition seen in the neonatal brain due to the deposition of bilirubin in localized parts of the cerebellum, mid-brain and brain stem. Those areas in the neonatal brain were particularly susceptible to damage from a number of causes, including anoxia and toxic and infective agents, and especially to the damaging effect of the indirect-reacting type of bilirubin, which was the pigment seen in cases of kernicterus. Those areas might be vulnerable because of their high oxygen consumption in the neonate, although anatomically they had a poorer blood supply than areas in the cortex. A lipid peculiar to those areas of the midbrain had been demonstrated in the neonate; that lipid had a particular affinity for the indirect-reacting form of bilirubin. Conversion of the indirect-reacting form of bilirubin to the direct-reacting form took place in the liver, so that impairment of the liver from any cause rendered the neonate brain liable to kernicterus. Anoxia might act in that way, as it caused spoiling of the liver cells, which were then unable to effect the conversion of indirect-reacting bilirubin, which thus attained high levels in the blood. A serum level of 20 milligrammes of bilirubin per 100 millilitres was accepted as the danger level for the development of kernicterus.

Dr. Turner went on to discuss the pathological and histological appearances of the kernicteric brain, and defined two clinical types: first, that of acute kernicterus in the neonate with opisthotonus and rigidity progressing to convulsions and death; secondly, the late sequelae seen in infants who survived the first phase. She said that such children usually presented the tetralogy of bilateral choreo-athetosis, extrapyramidal rigidity, deafness and mental deficiency. For practical purposes of treatment, three conditions in which kernicterus occurred could be defined. The first occurred in the immature infant with the so-called physiological jaundice, who was liable to develop sudden kernicterus about the fifth day, and who without treatment would die any time up to about the ninth day of life. The second type was that associated with haemolytic disease of the newborn, in whom the onset of jaundice was more rapid and kernicterus was likely to occur about the third or fourth day of life; if it was untreated it was concluded by death on the fifth day of life. Kernicterus in that type of condition was reversible in the early stages. The third type was seen in cases in which jaundice developed late, usually after the first week of life, and neurological involvement might be delayed for some weeks. It was not known for how many weeks the neonatal brain was susceptible to damage from that indirect-reacting form of bilirubin.

Dr. Turner said that the principles of treatment were basically the prevention of a high serum bilirubin level by means of the giving of fluids by several routes, and finally by the removal of bilirubin from the infant's circulation by means of exchange transfusion, and repeated exchange transfusion should the bilirubin reaccumulate after the initial exchange. She presented case histories of 14 premature infants, all of whom suffered primarily from anoxia and who developed kernicterus or potential kernicterus, and who all recovered (except one) after exchange transfusion. She also presented four other histories of mature infants suffering from haemolytic disease, to demonstrate the reversibility of kernicterus in its early phases. One of those infants had shown signs of neurological involvement for as long as forty-eight hours prior to the second exchange transfusion, and recovered without sequelae. All those infants received double exchange transfusions. Seven other such infants had been treated in similar fashion at the Queen Victoria Memorial Hospital, Melbourne.

S. E. J. ROBERTSON (New South Wales), in opening the discussion, said that he had examined and given exchange transfusions to a few babies suffering from kernicterus, but only if the serum bilirubin level was over 20 milligrammes per 100 millilitres. He was concerned with the difficulty of differential diagnosis of kernicterus from cerebral oedema due to trauma, and the risks of exchange transfusion to such infants. He was interested in the late onset of symptoms in some of Dr. Turner's cases. He

had noticed that Diamond was using cortisone for its chologogue effect; quite crudely, "it made the liver work". As an indication of early kernicterus, Dr. Robertson placed some reliance on the disappearance of the Moro reflex.

S. E. L. STENING (New South Wales) said that anyone seeing the after-effects of kernicterus would feel grateful to those who were doing work on the subject. He himself did not believe that the serum bilirubin level was the causal factor; it seemed more likely that some antigen-antibody reaction took place in the cell. He quoted the variable response of different babies to the same levels of bilirubin and the fact that the condition even ran in families. Cortisone was perhaps of value in blocking an antigen-antibody reaction in the cell. His experience with exchange transfusion was not so happy as Dr. Turner's.

I. MARTIN (Victoria) asked whether the areas of distribution of kernicterus perhaps corresponded with those areas in the brain known to have a poor blood supply and liable to damage from anoxia.

N. M. NEWMAN (Tasmania) asked whether Dr. Turner used cortisone or vitamin K in treatment, and whether in subsequent exchange transfusions she had adopted the method of incising the skin above the umbilicus and finding the vein there.

KATE CAMPBELL (Victoria) said that with the better modern treatment there was already much less kernicterus from erythroblastosis, and she hoped it would be practically eliminated in the future. Premature babies who developed kernicterus were not only the anoxic ones, but those who were badly bruised. They always developed severe jaundice and thus were at risk. Other types were premature babies with infections, and those whose cords were "milked" at birth and allowed to cease pulsating—that gave the infant an excess of blood. Oddly, there was less jaundice among premature infants weighing two to three pounds than in the three to four and a half pounds group. Dr. Campbell said that she had used the umbilical vein for exchange transfusion as late as the sixth day, finding it patent when cut flush with the abdominal wall.

Dr. Turner, in reply, said that late kernicterus did occur. She had seen one case, due to ABO incompatibility, as late as the third week. She was pleased to hear of the chologogue effect of cortisone. The only reason she knew for a familial incidence of kernicterus was some recent French work, which showed that 10% of families had a particular receptor substance in the brain with an affinity for bilirubin. The antigen-antibody theory could not account for kernicterus in premature babies. Dr. Turner agreed with Dr. Martin that there were areas with a poor blood supply, and that they tended to be the areas affected. She had not used cortisone *ante partum*, in view of the risk of producing foetal abnormality.

#### Some Problems in the Management of the Rheumatic Child.

BRYAN DOWD (New South Wales) read a paper on the management of the rheumatic child. He said that there had been a world-wide reawakening of interest in rheumatic fever in the last twenty years. The diagnostic criteria formulated by Duckett-Jones in 1944 had been a major advance in standardizing results in research centres throughout the world. They were of some—but less—help to the physician in practice.

Dr. Dowd said that rest and salicylates were still the sheet-anchors of therapy. Oxygen administration, sodium restriction and digitalization were of value when cardiac failure was present. The role of hormone therapy was difficult to assess. There was no sure way of detecting the susceptible child before rheumatic fever had occurred. Prophylaxis, which aimed at the prevention of recurrence of the disease, was quite as important as actual therapy, perhaps more so, since prophylaxis was less widely understood and practised. The American Heart Association had done much in the last five years to draw the attention of the medical profession to the importance of preventive measures. Those measures demanded consideration of (a) the early and adequate treatment of streptococcal

infection with penicillin in all persons, and (b) the attempt to prevent streptococcal infection recurring in the known rheumatic child or adult. The latter comprised (i) the eradication of the organism by penicillin in therapeutic dosage for not less than ten days (the single injection of a preparation containing crystalline, procaine and "Benzethacil" penicillin was probably satisfactory for that purpose), (ii) continuous protection against subsequent streptococcal infection by means of the daily administration of sulphonamide (or penicillin) tablets throughout the year. Continuous prophylaxis should begin with eradication of the organism, as had been pointed out earlier, as soon as the diagnosis was definite. It should continue for at least five years after the initial attack of the disease and probably for much longer. The scheme recommended by the American Heart Association was worthy of careful study and of practical application.

Dr. Dowd finally said that it was the physician's responsibility to explain the aims and risks of prophylaxis to the parent or patient, and to ensure continuity of preventive measures from dose to dose and from day to day, over the long period necessary. The mere prescription of a free drug or an expensive drug was not enough. No better conclusion could be offered than the opening sentence of the recently published recommendations of the American Heart Association: "Rheumatic fever is a recurrent disease which in most instances can be prevented."

LORIMER DODS (New South Wales) said that he was speaking as a proud impresario who for some years had been watching Dr. Bryan Dowd and Dr. Helen Walsh at work on that extraordinarily important problem of acute rheumatism—its diagnosis, prevention and treatment. He believed that recurrences of that disease could be prevented and that the organization and maintenance of adequate prophylactic measures were the special responsibilities of any medical practitioner who undertook the care of a rheumatic child. That prophylactic regimen should begin with adequate penicillin given parenterally as soon as the diagnosis of acute rheumatism was made, with the object of eradicating any real or supposed streptococcal infection, and that parenteral penicillin therapy should be closely followed by the continuous oral administration of either sulphadiazine or penicillin in appropriate dosage.

As Dr. Dowd had wisely pointed out, prophylaxis of that disease meant very much more than a bottle of tablets or a prescription. If adequate prophylaxis was to be achieved, then there must be full understanding and cooperation on the part of the parents and their family practitioner, who must be willing to accept the suggestion that all real or supposed streptococcal infections, however mild and transient, should be treated with adequate amounts of penicillin. Without that understanding and cooperation there would almost certainly be some obvious chinks in the armour of prophylaxis. That statement applied particularly to those occasions when a rheumatic child was taken to a "new" doctor, perhaps in the casualty room of a hospital or at a holiday resort, because of a relatively mild sore throat, and under such conditions the medical practitioner might be unwilling to accept the need for maintaining an adequate blood level of penicillin for about ten days.

In view of that type of hazard and the associated break in the prophylactic regimen, Professor Dods suggested that it might be advisable for the parents of every rheumatic child to carry a written statement which clearly defined appropriate methods of prophylaxis.

R. GREEN (New South Wales) asked whether the child who escaped cardiac injury in his first attack had any better chance of escaping it in subsequent attacks—whether, in fact, some children inherited "good" hearts.

M. T. COCKBURN (South Australia) asked for a definition of "adequate salicylate therapy".

Dr. Dowd, in reply, thanked Professor Dods for being a kind father to him and to his fellow workers. Dr. Dowd said that he had seen carditis appear in second attacks when the children had escaped it in the first attack; but



he agreed that some children could have several attacks and still escape. Chorea without carditis presented a difficult problem in prophylaxis. His dosage of salicylate was one grain per pound of body weight per day of ordinary aspirin, to a maximum of 60 grains per day,

until two consecutive normal blood sedimentation readings were obtained and there were other signs of subsidence, but he seldom continued to give aspirin for more than five or six weeks. If activity still persisted, it prompted consideration of the use of cortisone.

## Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine.<sup>1</sup>

*President:* Professor F. R. Magarey, M.D., M.R.C.P., F.R.A.C.P., New South Wales.

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*Honorary Secretary:* Dr. A. E. Gatenby.

### President's Address.

PROFESSOR F. R. MAGAREY (New South Wales) took as the subject of his president's address "Teaching Pathology". He said that the reason for which most people attended congresses was not to learn a great deal from listening to papers being read, but to renew old acquaintances. Nevertheless, there were some excellent papers to be read—perhaps there would have been more if there had not been such a surfeit of congresses lately, and if the Federal Council of the British Medical Association in Australia had not reserved the right to publish papers. Professor Magarey thought that that form of compulsion was a bad thing. It was important that specialized papers should be sent to specialist journals.

Turning to the main subject of his address, Professor Magarey said that during the past seventeen years the concepts of pathology had changed from a preoccupation with morbid anatomy to considerations of disturbance of function and to experimentation. Its ramifications had become so many that the medical curriculum was all too short to contain them, and the very large numbers of students at the University of Sydney increased the difficulty.

Professor Magarey said that it was most important to teach students to correlate pathology with what was taking place in the living patient, and therefore it was a grave anachronism to teach pathology either wholly or partly as a preclinical subject. At Sydney more than a third of the pathology course was covered before the students set foot in a hospital. That could be partly overcome by introducing clinical terms into the teaching of pathology, and by emphasizing from the first that pathology was, in fact, disease. The subject could be presented to students in a dynamic and vital form. It also presented an opportunity to train students in the scientific approach to methods and ways of thought; with small classes that could be done by precept and by practical experiments. With large classes at least the principles could be taught by giving a considerable experimental bias in lectures. The degree of B.Sc. (Medical) at the University of Sydney, requiring an extra year to be interpolated in the medical course, was an excellent thing and added much to a student's learning.

Professor Magarey concluded by saying that a true university education came from the teachers' succeeding in integrating for the students the isolated facts of medicine, and in teaching the students to think.

### The Pathogenesis of Thrombosis.

VINCENT J. MCGOVERN (New South Wales), in a paper on the pathogenesis of thrombosis, outlined the reaction to injury of vascular endothelium in the experimental animal and correlated this with the findings in human material. He said that in response to injury endothelium produced additional surface cement material in the form of granules. A metachromatic material from most cells then seeped through the endothelial cement lines, liquefying and diluting the surface cement granules. Upon defects in the film covering an injured endothelial surface platelets and leucocytes accumulated, and upon that accumulation a thrombus might form. Anoxia and severe local injury were two important causes of failure of the defence mechanism.

E. S. J. KING (Victoria) commented upon the complexity of the phenomena associated with thrombosis, and on the fact that different factors were important at different times. He stressed the importance of the type of work done by Dr. McGovern.

J. D. HICKS (Victoria) asked whether mast cells were present beneath the endothelium which had grown over thrombi in arteries which were being converted into atheromatous plaques.

Dr. McGovern replied that firstly it was difficult to find mast cells in tissue at longer than three hours after death, and secondly that it was very difficult to apply his technique of demonstration of the endothelial surface to large areas, but that he had found mast cells beneath the endothelium covering minor lipid plaques in the aorta.

E. W. GAULT (India) mentioned the work of Khanolkar in leprosy. He suggested that fuchsinophilic cells, probably mast cells, might assist in the spread of bacilli in early forms of leprosy. He asked whether Dr. McGovern had any information as to a possible part played by mast cells in other types of inflammation.

Dr. McGovern, in reply, said that he had not examined the mast cells in relation to inflammatory conditions, but that there appeared to be some effect like that of a spreading factor. Mast cells certainly facilitated the development of some inflammatory states. The triple response to injury was not due simply to the action of histamine. The "H" substance was probably a number of substances, rather than just "histamine".

W. J. SIMMONDS (New South Wales) asked whether the alteration in electrical potential due to heparin was likely to affect the amount of polysaccharide present.

Dr. McGovern, in reply, said that it was difficult to determine the exact nature of the effects of the substance

<sup>1</sup> The meetings held by the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine with the Section of Dermatology, the Section of Medicine and Experimental Medicine, the Section of Paediatrics, and the Section of Surgery have already been recorded.



liberated in injury to the endothelium. Heparin itself was not the spreading factor.

#### Preservation of the Clotting Factors in Stored Blood.

I. S. COLLINS (New South Wales) read a paper on the preservation of the clotting factors in stored blood. He said that in view of the widespread use of blood transfusions in clinical practice and of the doubts expressed by clinicians as to whether stored "blood bank" blood contained adequate amounts of clotting factors, investigations had been carried out at the Red Cross Blood Transfusion Service, Sydney. Blood was collected in the usual manner into acid-citrate-dextrose medium and stored in a cold room. The levels of factor V, antihæmophilic factor, prothrombin and factor VII were estimated after varying periods of storage, the level on the day of collection being used as a standard. Factor V and antihæmophilic factor were labile, the levels of each falling to about 50% in nine days and in eight days respectively. No significant deterioration occurred in either factor until the second day of storage. Prothrombin and factor VII were stable; only slight deterioration occurred in those factors by the end of a fortnight.

Dr. Collins said that blood from the Red Cross Blood Transfusion service was regarded as time-expired if it was unused by the end of a week. The investigations showed that blood collected and stored in the usual manner for periods of up to one week contained adequate amounts of plasma coagulation factors for all except hæmophilic patients. Evidence was provided that, under those conditions, "dilution" of the recipient's blood during massive transfusions through giving stored blood devoid of clotting factors was a misconception. In hæmophilia, blood should be given within twenty-four hours of collection.

J. V. DUNIG (Queensland) commented on the practical importance of the clarification of the problems under discussion in relation to the deterioration of the various clotting factors in stored blood.

H. F. BETTINGER (Victoria) referred to fatal hæmorrhage in childbirth due to lack of fibrinogen. He said that if supplies of prepared fibrinogen were not available, it seemed necessary to use direct transfusion to supply the deficient fibrinogen.

Dr. Collins, in reply, said that fibrinogen was a stable product, and one was not able to determine at what stage during storage it became ineffective. Probably fresh blood was as effective as direct transfusion in cases of fibrinogen deficiency.

#### Arterial Changes Producing Renal Disease.

J. D. HICKS (Victoria) read a paper entitled "Arterial Changes Producing Renal Disease". He said that the function of the kidney became inadequate when the total number of effective renal units fell below a certain level. It was important to think of the kidney as a multiple of renal units, for the study of the unit nephron and its reactions to changing conditions formed the basis of the understanding of renal disease.

Lesions of the aorta, such as thrombosis, atheroma or aneurysm, might interfere with the renal blood flow, and obliteration of the trunk of the renal artery might result in infarction of a large area of kidney. Obstruction of its segmental branches, which were end arteries, led to infarcts of smaller areas.

Of great interest was the production of hypertension by partial obstruction to the renal blood flow, and cases were recorded of the diverse accidents by which that took place.

Dr. Hicks then discussed conditions affecting the more intimate vessels of individual renal units in greater detail than those of the larger vessels. He said that many of the changes that followed obstruction of the afferent arteriole were an admirable demonstration of the effects of cutting off the blood supply to individual renal units. The pattern of response of the nephron to injury was fairly uniform, but it might be accepted as a general principle that the greater the degree of change and the more rapid the rate

at which it took place, the more obvious would be the lesions produced. Thus the more severe forms of obstruction of the arterioles, such as in malignant hypertension, focal "embolic" nephritis, and *polyarteritis nodosa*, were considered. The glomerular changes of partial necrosis of tufts, degeneration and proliferation of the epithelium, accumulation of leucocytes and formation of crescents were similar in all three conditions. Similar lesions were demonstrated in acute glomerulonephritis. That similarity of reaction suggested that fundamentally there might be common factors. Dr. Hicks examined in detail one of them, the presence of hyaline eosinophilic material, which in the acute lesions appeared "necrotic". From analogy with investigations by others suggesting that some hyaline material originated as thrombi, together with observations in the cases dissected, it was suggested that much of the eosinophilic material seen in the tufts, the afferent arterioles and the capsular space was coagulated blood or plasma. The difficulties of precise identification of the eosinophilic material in acute lesions might be partly due to the fact that it was in a process of change, its physical and chemical structure both altering during the conversion of blood to thrombus and its gradual incorporation as hyaline material, through to collagen.

Dr. Hicks finally said that there was evidence that there might be a fundamental similarity in the formation of the hyaline material found in the various types of more chronic renal disease. It seemed that vascular changes, thrombosis in particular, were concerned in much of the serious damage to renal units, in a number of apparently different conditions. The processes of repair and organization in time reduced the acute damage towards a common end result of fibrosis and atrophy.

W. J. SIMMONDS (New South Wales) asked two questions. He asked first in what way the afferent and efferent arterioles could be distinguished. His second question was whether there was any difference in degree of involvement of the tubules in relation to the cortical and juxtamedullary glomeruli.

Dr. Hicks, in reply, said that it was practically impossible to differentiate between afferent and efferent arterioles. It appeared to be a common assumption that the afferent arteriole was the vessel involved in most lesions. The lesions of the tubules were more often observed in relation to cortical than to juxtamedullary glomeruli, but he could not exclude the development of lesions in tubules of the latter type of renal units.

C. R. BLACKBURN (New South Wales) asked the following question: If the eosinophilic material in the capsular space in malignant hypertension was thrombus, how did it get there?

Dr. Hicks, in reply, said that he thought the eosinophilic material was a coagulation of blood or blood fractions. Hæmorrhage into the capsular space and tubules was frequent in malignant nephrosclerosis, and he imagined that coagulation of that extravasated blood produced the eosinophilic material in the capsular space.

J. O. MERCER (New Zealand) said that he had been interested in patients with malignant hypertension who had been treated with hypotensive drugs. He asked whether there was any evidence of healing in the kidneys of such patients.

Dr. Hicks, in reply, said that there was definite healing or repair in the kidneys of such patients. Acute "necrotic" lesions were no longer present. There was fibrosis in those glomeruli where originally severe damage had taken place. Presumably in lesser degrees of damage resolution had occurred.

#### The Nature of the Cytoplasmic Contents of the Argentaffin Cells.

A. C. CHRISTIE (New South Wales) read a paper in which he described histochemical observations on the nature of the cytoplasmic contents of the argentaffin cells. He said that the argentaffin cells, first described in 1879, had since been described in the intestines of all vertebrates. In man

they were as numerous in the large as in the small intestine. They had also been reported in the pancreas and gall-bladder and in teratomata. In the past many histochemical properties of the fine granules in the cells had been reported. Dr. Christie in his paper referred to the action of osmium tetroxide in fixing and blackening them, the chromaffin reaction, fluorescence in ultra-violet light and a positive diazonium reaction in alkaline solutions. The last-mentioned test reaction had been recently elaborated as a test by Danielli and called the tetrazonum test. Dr. Christie reported that the tetrazonum test gave a positive result with the granules alone or after treatment with di-nitrofluorobenzene, but not after prior treatment with performic acid. This indicated the presence of the indol nucleus, as, for example, in tryptophan or in 5-hydroxytryptamine. In recent years Erspamer *et alii* had demonstrated the presence of 5-hydroxytryptamine in the cells. Dr. Christie said that he had shown that 5-hydroxytryptamine both reacted with osmium tetroxide and gave the argentaffin reaction in a way closely resembling that of the argentaffin cells in tissue sections. It also possessed the indol nucleus. However, it did not give a positive reaction for phospholipids, as did the granules. The granules also gave a positive reaction (a reddish-brown colour) with Schiff's reagent after, but not without, prior oxidation with periodic acid, lead tetracetate or sodium bismuthate. A weak but definite positive reaction was also given by the phenylhydrazine or preferably the 2:4 dinitrophenylhydrazine test for aldehydes and ketones. These two tests were most likely to indicate the presence of either (or both) 1,2-glycol or  $\alpha$ -ketol linkages. The latter alone was considered more likely, as it would explain both reactions. The relatively weak reactions probably indicated that few such linkages were present in each molecule composing the substance of the granules. The granules were soluble in certain organic solvents known to dissolve lipids, in particular ethyl alcohol. Furthermore, if the granules consisted of protein, ethyl alcohol should fix them, but it did not, not even in the presence of formalin. Also, a positive reaction with Baker's acid hematin test indicated a phospholipid. Hence there was histochemical evidence that the granules consisted of a lipid and most likely a phospholipid, unassociated with a protein. The ability of formalin, osmium tetroxide and potassium dichromate to fix them was in harmony with that hypothesis, for they were well known fixatives of lipids. Dr. Christie referred to conclusions of other workers on the chemical nature of the argentaffin granules, and he finally postulated that the granules consisted of a phospholipid containing the base 5-hydroxytryptamine. Many lipids also contained  $\alpha$ -ketol groups, which would account for the phenylhydrazine and Schiff reactions, the latter occurring after appropriate oxidation.

F. R. MAGAREY (New South Wales) asked what was the function of argentaffin cells.

Dr. Christie, in reply, said that the function of the argentaffin cells was unknown. However, there were several hypotheses. Jacobson in 1939 had postulated that they secreted a pteridine and that their deficiency was responsible for pernicious anemia. A second theory had been put forward by another authority, who considered that the argentaffin cells formed an endocrine organ which was concerned with the regulation of renal function. Recently, a clinical syndrome had been reported as occurring in some cases of carcinoid tumours with metastases, mainly pulmonary stenosis and cyanotic lesions of the skin.

W. J. SIMMONDS (New South Wales) asked if there was any difference between the argentaffin granules in the fasting and the non-fasting states.

Dr. Christie, in reply, said that no definite difference had been noted.

A. E. GATENBY (New South Wales) recalled a case of a woman with argentaffin-cell carcinoma of the bowel with a cyanotic and irritable skin rash and disease of the heart valve. He asked whether Dr. Christie had any explanation of that combination of lesions.

Dr. Christie, in reply, said that several reports had been made of cases of that type. It was difficult to correlate any possible function of the argentaffin granules with the cardiac or skin abnormalities. Some workers had claimed that a substance similar to "serotonin" had been extracted from argentaffin cells.

#### Sarcoid-Like Lesions in Lymph Nodes Draining Carcinoma.

R. E. J. TEN SELDAM (New South Wales) read a paper entitled "Sarcoid-like Lesions in Lymph Nodes Draining Carcinoma". He reviewed the literature on sarcoidosis and said that a wide variety of conditions could provoke sarcoid-like lesions, including tuberculosis, leprosy, toxoplasmosis, *lymphogranuloma inguinale*, cat-scratch disease and poisoning by silica and beryllium, and the lesions also appeared in Riedel's struma and *struma lymphomatosa*. Identical lesions could be seen in lymph nodes draining areas where there was a carcinoma. It was probable that products of necrosis or metabolism of certain tumours caused those lesions, and that when scalenic lymph-node biopsies were performed as an aid to the diagnosis of intrathoracic lesions, and sarcoid-like lesions were found, the possibility that the intrathoracic lesion was a carcinoma should be borne in mind. Experiments on rats with extracts of breast cancers had so far produced no definite results, although it was suggested that the causative substance was probably a phospholipid.

D. METCALF (Victoria) said that Black and others in the United States had correlated hyperplasia of the reticulo-endothelial cells of the draining lymph nodes with the survival time for cancer of the stomach and breast. The histological changes were interpreted as evidence of host resistance to tumour growth, probably on an antigen-antibody level. Dr. Metcalf asked whether Dr. ten Seldam had been able to correlate the granulomatous changes in the lymph nodes of his patients with a prolonged or shortened survival time.

Dr. ten Seldam, in reply, said that there were no outstanding features in the survival times of his patients.

H. F. BETTINGER (Victoria) said that he had observed similar changes in lymph nodes from specimens obtained at Wertheim's hysterectomy for carcinoma of the uterine cervix, generally following irradiation. His interpretation was of a reaction which destroyed tumour tissue, particularly in association with radiotherapy.

A. A. PALMER (New South Wales) asked whether there was any degree of fibrosis around the lesions in the lymph nodes.

Dr. ten Seldam, in reply, said that there was little fibrosis, but often considerable eosinophilic "para-amyloid" material was present in the lymph nodes.

#### Sex Differences in Somatic Cells.

H. F. BETTINGER (Victoria) read a paper entitled "The Significance of Sex Differences in Somatic Cells". He said that since 1949 Barr and his associates had published reports that it was possible to distinguish, in the nucleus of many somatic cells, differences which indicated whether that nucleus came from the tissues of a male or female animal. Dr. Bettinger explained that at mitosis the individual chromosomes could be distinguished; the X chromosome was usually one of the largest, while the Y was very small. Barr had suggested that the XX or female pair was too large to blend into the chromatin network after the nucleus came to rest, whereas the XY or male pair had no such difficulty. The female pair could be seen in many nuclei as a chromatin clump within the chromatin network, usually at the periphery of the nucleus directly under or near the nuclear membrane. Not all tissues showed those clumps with ease; in man they could easily be seen in the squamous epithelium of the skin, and as a small, drumstick-like extra lobe in mature neutrophil leucocytes. They could not be seen in every female cell nor was there an absence of similar structures in some male cells, but the rates of their occurrences in the two sexes were such that there was no difficulty in distinguishing whether a group of cells came from a male or a female individual.

Dr. Bettenger mentioned an interesting application of this work in connexion with teratomata. In female individuals the nuclei of all teratomata showed the female pattern; whereas in males the nuclei of about one-half of all teratomata showed the male pattern and the rest the female pattern. However, he was concerned with certain suggestions as to the practical application of this knowledge. It had been suggested that it could be used to determine the sex of parts of a dismembered body, but the effect of decomposition had not yet been studied. In the case of persons of indeterminate sex it had become customary to ignore the facts of physical sex, and to determine the psychological sex, and to adjust the physical features by medical and surgical means accordingly. Dr. Bettenger feared, now that it was so simple to determine the physical sex of an indeterminate person, that the psychological sex was likely to be ignored, and such persons would be likely to be forced into wrong situations. To illustrate the danger of this, Dr. Bettenger showed one diagram demonstrating the ordinary XX and XY mechanism determining physical sex, and another based on the concept that while the X chromosome contained factors for femaleness, the factors for maleness were not contained in the Y chromosome, but in either one or all of the autosomes. Following the second concept, it had been shown that sex was determined by a kind of genetic equilibrium, which was usually adjusted so that there was clear-cut differentiation; but in some cases the preponderance of male or female genetic factors was not great enough; in such cases the individuals showed a mixture of features, and often the psychological and physical development did not proceed in the same direction. It was Dr. Bettenger's opinion that the psychological factors were the important ones, and the physical determination of sex by the new technique should not be allowed to interfere with the psychological management of such patients.

P. WARNER (South Australia) asked whether Dr. Bettenger had made any observation of the frequency with which the sex chromatin was found in skin biopsies from patients suffering from intersexuality.

Dr. Bettenger, in reply, said that gonad and skin were both expressions of underlying chromatin structure, and what was found in a biopsy was simply a reflection of a normal ratio, for whatever gonad was present. They should not be concerned with the actual structural state.

#### Morphological Study of Lesions of Skeletal Muscle.

T. J. CONSTANCE (New South Wales) read a paper on the morphological study of various lesions in skeletal muscle. He said that frequent findings in skeletal muscle involved by disease included degeneration and atrophy, and often both those features were present together in varying degree in the one lesion. Signs of regenerative activity were rarely observed in the damaged muscle. Degeneration usually manifested itself as a hyaline swelling, and that structural change was sometimes associated with necrosis of the muscle fibre. Inflammatory changes developed secondarily in the supporting connective tissue, and the necrotic fibre was invaded and phagocytosed by histiocytes and other inflammatory cells. The main change in neurogenic lesions and in ischaemia produced by vascular disease was atrophy of the fibre; a similar result was induced by mechanical compression. Multinucleated giant cells of muscle origin were sometimes observed, especially in muscular tissue involved in a fibrotic process. They were usually present in large numbers in muscle regeneration produced experimentally. Those muscle giant cells might be almost indistinguishable from foreign-body giant cells, and careful study, together with special stains, would then be necessary for their recognition. All those changes in the muscle fibre were of a non-specific character, and seldom could they be regarded as distinctive of any particular pathological process. Dr. Constance said that the diagnosis of a muscle lesion therefore had to be based not only on the structural changes in the fibre, but also on the findings in the supporting connective tissue of the muscle and on the clinical and pathological features in other structures. However, it should be emphasized that the changes in the interstitial

connective tissue of the muscle were not necessarily of a specific nature; they might be secondary to damage of the fibres.

A. A. PALMER (New South Wales) asked whether Dr. Constance implied that it was impossible in a biopsy to distinguish primary lesions of muscle from secondary lesions.

Dr. Constance, in reply, said that he thought full clinical details should be submitted before one committed oneself to a definite diagnosis.

R. E. J. TEN SELDAM (New South Wales) asked whether Dr. Constance had taken precautions about the fixation of muscle biopsies, in that uneven contractions with irregular staining often followed immediate fixation, whereas immersion in saline at 37°C. for a short time was necessary to obtain even staining.

Dr. Constance said that adequate precautions must be taken, otherwise misinterpretation of "artefacts" might follow.

#### Molluscum Pseudocarcinomatousum.

A. TAIT SMITH (Victoria) read a paper entitled "Molluscum Pseudocarcinomatousum". He said that that name had been given to a condition originally described as *molluscum sebaceum* or *keratoacanthoma*. It was commonly diagnosed as a squamous-celled carcinoma. Typically it was a dome-shaped elevation of the skin, especially of the neck, nose, cheek, dorsum of hand or forearm, which reached its maximum size in four to six weeks, latterly topped by a shallow scab or a shallow crater, filled with sebaceous material or with a sleeve or collar of stretched, reddened epidermis sloping down the sides of the dome. The characteristic feature was that the lesion was space-occupying, rather than infiltrating, in the skin. The macroscopic appearance of the whole tumour was typical, though a biopsy of a small portion might give every appearance of a squamous-celled carcinoma. Without treatment the condition would always undergo spontaneous resolution within several weeks; if it was removed, it should be completely excised.

F. R. MAGAREY (New South Wales) said that in his opinion one did not need a microscope or even a biopsy to diagnose *molluscum pseudocarcinomatousum*. Usually the history was sufficient.

J. O. MERCER (New Zealand) asked whether in that condition there was any invasion of muscle. He also asked what the common sites were.

Dr. Tait Smith, in reply, said that he would be very suspicious of carcinoma if he saw muscle invaded. The common sites that he had seen were the nose, the cheek, the back of the hand and the forearm. In one case in his experience the condition had occurred in the anus.

A. C. CHRISTIE (New South Wales) asked what was the effect of radiotherapy in that condition.

Dr. Tait Smith, in reply, said that much of the success of treatment of squamous carcinoma was probably due to a misdiagnosis of *molluscum sebaceum*. A dose of 1000r was usually satisfactory.

A. G. FINLEY (New South Wales) said that there was no doubt that the tumours were common and that their recognition had given cause to review the incidence of skin cancer. From the point of view of the clinician the diagnosis could be made quite readily in most cases, but in some the distinction from squamous carcinoma might be difficult. Dr. Finley said that he was interested in Dr. Smith's remark that it was a "space-occupying lesion", for he believed that was one of the outstanding features about it from the clinical point of view—the manner in which it rose steeply from the skin without any suggestion of infiltration into its surroundings. With regard to the site of occurrence, most of the cases he had seen had been on the exposed areas, notably the face, ears, hands and forearms. He had seen one on the lower lip. The question of X-ray dosage was probably without much meaning in a tumour which would disappear spontaneously even without



treatment, but he had seen a few of the tumours which seemed to make little response to smaller doses of X rays (600r to 1000r).

P. WARNER (South Australia) mentioned two cases of apparent *molluscum pseudocarcinomatousum* of rapid growth, which were really cases of squamous-cell carcinoma. In one, the condition metastasized to lymph nodes at the elbow, and in the other to nodes in the axilla. Dr. Warner asked whether Dr. Tait Smith had any indication of the aetiology.

Dr. Tait Smith, in reply, said that one worker had injected emulsion of *molluscum pseudocarcinomatousum* into himself and into the patient without producing any lesions. He had no suggestions to offer.

W. W. LEMPRIERE (Victoria) said that he thought it was all very difficult trying to decide whether the lesion should be left alone; but what might be worse was trying to persuade the patient to retain the tumour. He thought that irradiation was most effective in small dosage.

J. D. HICKS (Victoria) referred to the difficulty of certain diagnosis from a small biopsy. He repeated Dr. Warner's caution about misdiagnosis of true carcinoma, and cited a case of squamous carcinoma in which the patient died of extensive metastases within three months of commencement of the lesion. With reference to the aetiology, Dr. Hicks said that an association with injury such as an abrasion, a splinter or being pricked with a rose thorn (which several patients had insisted was the starting point of the lesion) seemed a common factor.

#### Variants of Poliomyelitis Virus.

N. F. STANLEY (New South Wales) read a paper entitled "Variants of Poliomyelitis Virus", in which he briefly described the derivation and properties of some of the attenuated variants of the virus. He did not discuss their possible application to the immunization of man, but was concerned mainly with the paralytic ability, physical properties and cytopathogenic behaviour of types I, II and III. Only scanty information was available on naturally occurring variants. It was suggested that an epidemiological investigation (involving the inoculation of tissue cultures, mice and monkeys) of healthy children during epidemic and interepidemic periods would increase the existing knowledge of poliomyelitis.

As a result of recent observations carried out in four laboratories in the United States and one in Sydney, at least sixteen variants of poliomyelitis virus had now been obtained through laboratory manipulation. At the Lederle Laboratories, Cox and Koprowski and their colleagues had developed two variants of type II poliomyelitis virus (MEF<sub>1</sub> strain) with diminished paralytic ability for monkeys by many brain-to-brain passages in suckling hamsters followed by passage in chick embryos. In 1954 that same research group adapted a type I poliomyelitis virus to mice and cotton rats after alternate mouse and tissue culture inoculations. That strain was not paralytic for 54 monkeys after intracerebral inoculation.

Sabin, at the Children's Hospital Research Foundation in Cincinnati, had developed variants of all three types of poliomyelitis virus with diminished paralytic ability for monkeys after rapid passage of large inocula in tissue cultures followed by the method of terminal dilutions. Li and Schaeffer, from the Communicable Disease Centre at Montgomery, Alabama, had described the adaptation of types I and III poliomyelitis viruses to mice by the intraspinal route. A type I strain was eventually developed, by alternate passages in monkey skin and tissue cultures, that appeared to be devoid of all paralytic ability for mice and monkeys as observed by intracerebral or intraspinal inoculation. The Institute of Epidemiology and Preventive Medicine, at Sydney, had developed a variant of the Alabama type I poliomyelitis virus after intracerebral inoculations of mice. Further investigation revealed that an early paralytic phase variant was associated with a 30m $\mu$  particle, and a late paralytic phase variant was associated with a 24m $\mu$  particle. That was demonstrated by the use of the agar diffusion technique developed by

Polson in Cape Town, and used by him to reveal two sizes of infective particle for the viruses of Rift Valley fever, type II poliomyelitis and neurotropic African horse-sickness. By the use of tissue cultures of monkey kidney as a source of host cells it was likely that genetic recombination had been demonstrated between the original highly paralytic (for monkeys) type I strain and a strain non-paralytic for monkeys but paralytic for mice. That resulted, after passage at limiting dilutions, in the recognition of a variant lacking the ability to paralyse monkeys or mice. Dr. Stanley presented tables and figures in which the properties of variants were summarized.

PHYLLIS ROUNTREE, D.Sc. (New South Wales), asked two questions. The first was why there should be a difference between intracerebrally and intraspinally inoculated strains of virus. The second question was why a virus which would grow in the nervous system of mice would not do so in humans.

Dr. Stanley, in reply, said that a virus which would grow when inoculated intracerebrally would also grow if inoculated intraspinally. One which would not produce paralysis when inoculated intracerebrally might do so when inoculated intraspinally. In human beings, the natural route of infection was oral. If a virus produced paralysis when injected intraspinally, but not when injected intracerebrally, then the strain was generally regarded as satisfactory for oral "inoculation".

P. WARNER (South Australia) said that if disseminated attenuated virus was used for prophylaxis, he wondered whether it was possible for that virus to develop or regain its virulence during passage through the community.

Dr. Stanley, in reply, said that it probably could do so.

#### Virus Multiplication.

P. M. DE BURGH (New South Wales) discussed virus multiplication. He said that the growth curve of many viruses showed that there was a fall in infectivity followed by a rise to a level higher than the initial one. That was described as a stepwise form of multiplication and was probably a result of the peculiar nature of viruses. That peculiarity was that the viruses had none of the enzymes which were believed to be necessary to energy production or synthesis. It was probable that the fall in infectivity was concerned with the establishment of control of the cell by the virus—with the direction of the host's synthetic processes to virus production. That often resulted in extensive and damaging effect on the cell, although the amount of virus material was very small compared with the total volume of the cell. There seemed to be no reason why a virus should not multiply without cell damage. The study of the means by which a virus gained control of the cell was related to various fields of study, such as cancer and degenerative diseases, as well as normal cell physiology.

E. H. DERRICK (Queensland) asked whether there were any practical applications of the theory of virus multiplication. He wondered whether it was possible to interfere biochemically with those narrow paths of virus metabolism.

Professor de Burgh, in reply, said that no therapeutic methods were available. However, an interesting phenomenon had been observed in the relationship of *Bacterium coli* to bacteriophage. The multiplication of both *Bacterium coli* and bacteriophage might be inhibited by sulphonamide. The addition of purine or methionine would allow a slow progression of the *Bact. coli*, but the phage could not use those substances and remained inhibited.

#### In-Vitro Effects of Antibiotics on the Multiplication of *Entamoeba histolytica*.

T. C. BACKHOUSE (New South Wales) read a paper on the in-vitro effects of antibiotics on the multiplication of *Entamoeba histolytica*. After referring to the first use of cultures of *E. histolytica* for the testing of the amoebicidal effect of emetine *in vitro*, Dr. Backhouse went on to mention some of the difficulties inherent in the employment of



mixed cultures. He said that cultural work had been aimed at developing methods of growing the amoeba in the absence of other living cells. Recently an association of *E. histolytica* and *Trypanosoma cruzi* had been used for testing antibiotics, since it was claimed that they were without effect on the trypanosome.

In the work reported in the paper, mixed bacterial cultures had been used to observe the effect on them of various antibiotics as judged by counts of the amoebae after forty-eight and seventy-two hours' incubation. The antibiotics used were penicillin, streptomycin, "Terramycin", "Tetracyclin", "Aureomycin", "Chloromycetin", "Ilotycin" and fumagillin. The results were shown in tabular form, and comparisons were drawn with those of published reports, with which they were in general agreement. Fumagillin was the only one among them that appeared to be amoebicidal without being bacteriostatic. Penicillin, streptomycin and "Ilotycin" were more or less inactive; the remainder showed varying degrees of activity against the amoebae in fairly high dilution, but whether direct or indirect could not be determined in such cultures.

F. STEWART (Western Australia) asked what was the origin of fumagillin.

J. V. DUHIG (Queensland) asked whether any work had been done also on *Entamoeba histolytica* cysts.

A. V. G. PRICE (New South Wales) said that he thought that systematic work of the nature carried out by Dr. Backhouse would be certain of ultimate success in the treatment of amoebic dysentery.

In reply to the question by Dr. Stewart, Dr. Backhouse said that fumagillin was like other antibiotics, derived from a fungus; it was available commercially. To Dr. Duhig, Dr. Backhouse said that the antibiotics had not been directly tested against cysts, but since the cysts were derived from amoebae in the lumen of the bowel, the action on these would prevent cyst formation.

R. H. BLACK (New South Wales) said that in some experiments with antimalarial drugs the serum of persons who had taken the drugs by mouth was used as a constituent of the medium in which the parasites were grown; he wondered if that method of approach had been applied to amoebicidal substances.

Dr. Backhouse replied that he had not used that method and had seen no mention of it in the literature; it was a good point for future consideration.

#### Oral Treatment of Pernicious Anæmia.

P. I. A. HENDRY (New South Wales) read a paper on the oral treatment of pernicious anæmia. He said that at the Royal Newcastle Hospital eight patients suffering from previously untreated pernicious anæmia had been treated with varying doses of combination tablets of vitamin B<sub>12</sub> and folic acid; each tablet contained an amount of each hæmatin below the known effective level when given separately. The reticulocyte level reached compared favourably with that which could have been expected for each initial erythrocyte count. The expected cell levels were reached in the five patients receiving the higher doses, and in part only in the three patients receiving the lower doses. Dr. Hendry said that four patients had been followed up for eighteen months, one for six months, two for two months, and one for one month. One patient had been adequately maintained for eighteen months without incident. One patient at four months developed hypertension necessitating venesection, but had been adequately maintained for a further sixteen months. One patient voluntarily stopped treatment at the end of nine months because he felt very well; he relapsed, but when further treatment was instituted he was adequately maintained. One patient was well maintained for six months and then became erratic in taking the tablets and had several alcoholic bouts; he developed subacute combined degeneration, which was cured by further treatment. The patient continued to improve in health during the next five months and then suffered a relapse from an old chest infection, after which his blood count deteriorated. Two patients

had been followed for only eight weeks and were progressing slowly, and the eighth patient, after two months' treatment, was given vitamin B<sub>12</sub> injections in error.

Dr. Hendry said that the results of the trial showed that with adequate dosage a complete clinical and hematological remission could be obtained in practically all cases, with the exception of the mean corpuscular volume, which remained higher than normal. Subacute combined degeneration did not develop, but in fact was relieved by the treatment. Maximal reticulocyte responses were obtained with doses as low as 25 microgrammes of vitamin B<sub>12</sub> and 1.67 milligrammes of folic acid per day, and once normal erythrocyte levels were reached they could be adequately maintained on that dosage. Higher doses were necessary to raise the erythrocyte count to normal within eight weeks.

A. E. GATENBY (New South Wales) congratulated Dr. Hendry on his original work, which he thought was valuable from the point of view of sparing the patients expense and the pain of injections. Dr. Gatenby noted that Dr. Hendry allowed a small percentage, deducting a figure for the trapped plasma. He asked whether there was any advantage in that.

Dr. Hendry, in reply, said that they had wished to be as scientifically accurate as possible in the preparation of the paper.

E. W. GAULT (India) asked how folic acid and vitamin B<sub>12</sub> reacted together. He wondered whether vitamin B<sub>12</sub> replaced the intrinsic factor.

Dr. Hendry said it was thought that folic acid was absorbed in the stomach and, with some alteration, took the place of the intrinsic factor.

F. STEWART (Western Australia) asked whether Dr. Hendry had had any experience of an alternative method to fractional test meal examinations for the estimation of achlorhydria.

Dr. Hendry, in reply, said that he wished to apply another test, but his biochemists were overwhelmed with routine work and no definite trial of the method had been undertaken.

#### Red Cell Life Span in Carcinomatosis.

G. A. W. JOHNSTON (New South Wales) read a paper on the red cell life span in carcinomatosis. He said that for many years the association of hæmolytic anæmia with malignant disease had been recognized. The evidence had usually been on clinical, indirect hæmatological and biochemical findings. Recently a more direct and sensitive assessment of hæmolysis had been obtained in those cases by red cell survival studies. From those studies it appeared that hæmolysis was a more common complication of malignant disease than was generally realized. The differential agglutination technique of Ashby was open to the obvious criticism that it was the behaviour of the donor's cells and not the patient's own cells which was observed. The introduction of isotope techniques for determination of red cell life span overcame that objection.

Dr. Johnston said that by the use of the Ashby and radioactive chromium techniques the red cell life span was studied in ten cases of carcinomatosis complicated by an anæmia which could not be explained by blood loss, nutritional deficiency, infection or radiation. The red cell life span was reduced in three of those cases.

D. METCALF (Victoria) said that the evidence of shortened survival times for red blood cells in cases of carcinomatosis partially accounted for the anæmia in those patients. He asked whether the diminished life span of the red cell was primary or secondary. The question was rather analogous to the origin of the anæmia of chronic lymphatic leucæmia. It had formerly been believed that leucæmia was a disease confined to the white cells alone. The anæmia was ascribed simply to a displacement of the red marrow by white marrow. That assumption was now known to be incorrect. Profound intrinsic disturbances had been shown to exist in the lungs, spleen and liver of leucæmic patients. In many cases of that disease there

was frank hæmolytic anæmia and in others an abnormally short red cell survival time. Contrary to what had formerly been believed, the marrow produced twice as many red cells as normal marrow. The anæmia of lymphatic leucæmia was probably therefore due to concomitant intrinsic disease of the red-cell-forming tissues. Dr. Metcalf said that those present would do well to bear in mind that although the shortened survival time of red blood cells found in carcinomatosis was only secondary in nature, the possibility existed that that experimental finding was evidence of a fundamental abnormality which had also permitted the development of cancer in those patients.

#### Reactions Associated with Blood Transfusions.

R. J. WALSH (New South Wales) discussed reactions associated with blood transfusions. He said that a reduction had occurred during the past ten years in the number of such reactions. The credit was mainly due to the nursing profession and the laboratory technicians. It was now possible to define five main types of reaction. The pyrogenic, characterized by pyrexia and rigor, was the most common. The allergic reaction might be disturbing to the patient and diverse in its manifestations. Circulatory overloading was probably more frequent than was realized, whilst hæmolytic reactions might directly result in death. Infection of blood prior to its administration was a potential danger whenever blood was stored, and rigid safeguards were necessary.

The majority of transfusion reactions were preventable, but only if there was careful organization in hospitals. In most instances hospital organization had not kept pace with the growth of transfusion therapy, mainly because it was the responsibility of no one individual. The pathologist was the logical person to undertake the work, because many aspects were concerned with laboratory procedures. He should investigate the effects of transfusions and any untoward reactions that might occur. In the larger hospitals consideration should be given to the formation of a division within the pathology department for that purpose. Future large hospitals should be designed to provide an autonomous department for intravenous work. Smaller hospitals, especially in the country, obviously could not be organized in the same way. However, the appointment of

a transfusion officer from the permanent medical or nursing staff would greatly reduce the risks of transfusion accidents. Adequate training of the person appointed was essential, and centralization of all intravenous work, even in the smallest hospital, was most desirable.

P. I. A. HENDRY (New South Wales) asked how pyrogenic reactions were assessed in patients who already had an elevated temperature when the transfusion was given. Dr. Hendry suggested that it was most undesirable to have only a sister in charge of intravenous therapy.

Dr. Walsh, in reply, said that his criterion of a pyrogenic reaction was a rise in temperature soon after the transfusion was given. It might be very difficult to decide, but a rise in temperature occurring *de novo* or a rigor was very good evidence. With regard to Dr. Hendry's second point, Dr. Walsh said that a medical adviser was to be preferred, but it was out of the question in some of the country districts to provide a medical officer specializing in intravenous work.

A. R. HAZELTON (New South Wales) said that in Goulburn he did all the transfusion and intravenous work and acted as a central depot or base for transfusion units in the surrounding districts.

A questioner asked whether there had been any improvements in the storage of red cells for survival.

Dr. Walsh replied that the normal rate of disintegration of blood was about 8% in ten days. In perfect storage conditions of low pH, glucose, isotonic citrate solution and low temperature that rate of survival was maintained. Experiments with the addition of glycerol and deep freezing to  $-79^{\circ}\text{C}$ . had resulted in satisfactory storage for a very long period, but the difficulty was the removal of glycerol when the cells were required for use.

G. A. W. JOHNSTON (New South Wales) asked whether it was safe to resume a transfusion in which a reaction appeared to have occurred, although there was no obvious hæmolysis in the plasma from the patient.

Dr. Walsh replied that it was not safe to do so. Much of the damaged or destroyed blood was removed by the extravascular reticulo-endothelial system, and therefore hæmoglobin was seldom seen in the plasma after transfusion reactions.

## Section of Public Health and Industrial Medicine.<sup>1</sup>

President: H. M. L. MURRAY, L.R.C.P., L.R.C.S., L.R.F.P.S., D.P.H., Tasmania.

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Honorary Secretary: Dr. R. T. C. Hughes.

#### President's Address.

H. M. L. MURRAY (Tasmania) took as the subject of his president's address "The Forgotten People". He said that the dominant theme of his address was that public health was people and that the best result would be achieved by remembering that people were individuals. Public health administrators must resist the temptation of thinking of people as pawns upon whom they could impose their will—always, of course, for the ultimate good of the victims. The people who did the best work in the field of public health were those who were in contact with people as individuals,

and they were the real workers in health education. Baby health nurses and the staff of the school medical service were in the forefront of the work, the object of which was to ensure that children grew up into as healthy citizens as possible. More could be accomplished by five minutes' quiet discussion between mother and school medical officer than by thousands of posters and pamphlets and all the apparatus of high-powered publicity. The apparently normal child was just as important as the child with a defect discovered at clinical examination; and the key to progress was gaining the confidence of the mother.

Similarly in industrial medicine, the great need was for health education; and in that respect, education of the industrialist was most important. There was a basic

<sup>1</sup>The meetings held by the Section of Public Health and Industrial Medicine with the Section of Radiology and Radiotherapy and the Section of Orthopaedics have already been recorded.

relationship between human efficiency and industrial efficiency, and human efficiency depended on the application of simple physiological principles. The great contribution that medicine could make to industry was an application of a knowledge of physiology to problems of production. Unfortunately, as a profession, doctors had missed the opportunity to teach simple physiology, and instead had sold themselves by setting up minor ailment clinics in factories, and, worse still, by allowing medical service in industry to be used as a labour-catching stunt.

The profession had concentrated on a minority who were clinically sick, and had forgotten the great majority, not obviously ill, who looked to them to help them to better health. They had a heavy responsibility to those forgotten people, and they must remember always that each one of them was an individual faced by the task of integrating himself into the complexities of modern life without loss of his individuality.

T. K. ABBOTT (New South Wales) said that during the previous week he had been privileged to attend several sessions of the Asian-Pacific Tuberculosis Conference held at the University of Sydney. Beneath all the very interesting technical discussions he had detected two undercurrents of thought, which he thought could be appropriately mentioned in relation to Dr. Murray's president's address. Dr. Abbott said that, firstly, he had been conscious of an underlying current of distrust on the part of the clinician towards the public health man, whose scalpel was his statistics and whose mental attitude to sick persons appeared to be more detached than the clinician's own. Dr. Abbott thought it important that in drawing towards the clinician, as they must surely do, they did not allow to grow up the idea that the public health man was less humane, less concerned about men and patients than his colleague. Often the public health man had deliberately to steel himself against becoming bogged down in treating individuals. He knew that to do so rendered him ineffectual. His job was to see disease over wide geographical areas, and to do that against an historical knowledge of his subject. But he often wished that he could tarry by the wayside with people who were sick. In other words, the clinician saw the patient with diphtheria as a clinical entity specifically to be treated now, at that very minute, against a background of personal and family distress. The public health man viewed the same patient in relation to the rest of the population under his care and at risk, against a background of human suffering at large. At least, Dr. Abbott conceived that it was his duty to do so.

Dr. Abbott went on to say that he had deliberately stressed what he knew was obvious; but he felt very strongly that it was important that clinical and public health medicine be not allowed to stray far from each other. Both sides should remember that for better or for worse they had married medicine with the best motives—those of helping their fellows. Whichever field they later strayed into after graduation, those motives remained, he hoped, and he felt that in asking the clinicians to believe that the public health men had not altogether sold their souls to the statistical-paper form of medicine, and to try to understand their concepts, the public health men must honestly try to keep up with developments in clinical medicine. If only from a utilitarian point of view, the public health men ignored those precepts at their own peril.

Dr. Abbott then said that the second point to which oblique reference had frequently been made at the Asian-Pacific Tuberculosis Conference was the different concept of the disease as spoken of in Australia and as seen in the daily work of many of the Asian-Pacific delegates. It seemed to him that the floodlight was turned on the whole of their origins as public health men. For the doctor in Asia, tuberculosis was a massive disease (as it once had been in Australia), against which the refinements of surgery and complicated case-finding follow-up systems were luxuries devoutly to be wished for. Because the death rates and morbidity were unbelievable to Australian doctors, and because their countries had relatively little money available, either as State aid or as patients' fees,

the Asian doctor was willy-nilly forced to think of the problem as a public health one. First-aid measures to stem the flood were his great concern. He knew only too well that patients who could be saved elsewhere must in this area be ignored. It was from such origins as those that the public health men derived their *raison d'être*. The inability of individual medicine effectively to intervene in cholera, plague, typhus, small-pox and so on had forced on their peoples the experiment of setting aside some of the doctors to be trained in the concept of treating and preventing mass disease. Dr. Abbott felt that it was important that they should think often and deeply of the history of their origins. There was sufficient reason to do that simply to give sound basis to their judgements in their daily public health work. However, the Asian-Pacific Tuberculosis Conference had clarified in his mind the urgent necessity for them to do that for another reason—namely, that those Asian and other workers in the undeveloped countries were the real public health doctors, doing what their ancestors did, and doing it in deadly earnest. They still had to cope in their day-to-day work, almost empty-handed, with those dread diseases which many of those present had never seen. As their two ways of life drew nearer on a political level, Dr. Abbott felt it imperative that Western public health men should keep themselves fully aware of the Asian doctors' problems, so that when the time came, as surely it would, they could offer real help, and not appear in the role of "paper doctors", whose only interest and experience was in an administrative machine which handled half a dozen cases of diphtheria a year.

#### Patterns of Poliomyelitis Immunity.

J. A. R. MILES (New Zealand) discussed patterns of poliomyelitis immunity. He said that the age incidence of poliomyelitis had altered greatly in civilized communities during the last thirty years, and from being a disease mainly of children under the age of five years it had become a disease in which 35% to 50% of the subjects were aged fifteen years or more. In backward countries there had been no comparable change, and the disease remained a disease of infants and young children under the age of four years. In isolated communities without previous experience of the disease, all age groups suffered, but adolescents appeared to suffer more severely than other age groups.

Professor Miles went on to say that from serological surveys made in other parts of the world there appeared to be three main patterns of immunity to poliomyelitis. In backward areas the viruses were highly endemic, and almost all the population developed an immunity in infancy or early childhood. In the more advanced communities, the endemicity was not so intense, and many people reached adolescence without ever acquiring immunity. The disease behaved as a low-grade endemic disease with epidemic incidents. In remote and isolated small populations, there was not sufficient influx of susceptibles for a disease establishing so solid an immunity to become endemic. The viruses were occasionally brought in, and universal infection followed, the whole population receiving either an inapparent or a clinical infection. Australian investigations on the aborigines in the Northern Territory suggested that poliomyelitis viruses periodically spread through the scattered tribal groups, possibly as an overflow from epidemics among the whites, and that when they did so, the vast majority of susceptibles became infected. However, some epidemic waves might fail to reach some of the most remote and isolated tribes. The results of investigations on the white population of South Australia suggested that poliomyelitis viruses were not endemic, but occurred in epidemic waves, particularly infecting children under the age of ten years. Older children and adolescents did not often become infected even during the known epidemics of a proven type in their community, although when they were attacked, the disease was more serious than in the younger children. Professor Miles said that these findings indicated that serious consideration should be given to including adolescents and young adults in any vaccination programme in Australia.



N. F. STANLEY (New South Wales), in opening the discussion, said that Professor Miles's stimulating paper came at a time in the history of poliomyelitis when such epidemiological investigations were highly important and might serve as a basis for studying variations resulting from the wide-scale use of vaccine. In Sydney, they had used tissue cultures of trypsinized monkey kidney epithelial cells grown in bovine amniotic fluid to detect the presence of *Poliiovirus hominis* or antibody to it. The results of serological surveys in New South Wales, Queensland and New Guinea had been compared with data obtained by Murphy and Ferris in New Zealand and Victoria respectively. Between 1950 and 1955, New Zealand, Melbourne, Sydney and Brisbane had appeared to differ as far as type II poliovirus was concerned. In Melbourne, as in New Zealand, epidemics of paralytic poliomyelitis had recently been associated with type II infection. In Sydney, type II antibody was more often found in healthy individuals than the other two types, but was rarely associated with paralytic disease, while in Brisbane type II antibody was not found in the few patients (aged two and a half to thirty-three years) with paralytic disease that had been tested so far. Those differences, suggested by an examination of only a few individuals, warranted further investigation. The sera from Queensland were obtained through the courtesy of Dr. D. W. Johnson, of the Department of Public Health.

Dr. Stanley compared the antibody levels of healthy children from a sewered area and an area in which children lived in close association with faulty septic tanks. A table showed that 58% of children under six years of age developed antibodies to the three types of poliovirus in the faulty septic tank area, whereas no child had antibodies to all three types in the sewered area selected. Of children from the faulty septic tank area, 92% had antibodies to type I poliovirus. Serum from New Guinea highland natives was received through the courtesy of the Nuffield Expedition. Neutralization tests showed that in one district 83% of natives had antibodies to type III poliovirus. That figure was significantly higher than that found in the white population.

E. FORBES MACKENZIE (Victoria) gave figures relating to paralysis.

GEORGE MCQUEEN (South Australia) referred to septic tanks. He said it looked as though the figures suggested that there was a danger in septic tanks.

C. E. A. COOK (Australian Capital Territory) said that he was appalled by the figures. He gathered that the septic tank was blamed for an incidence of poliomyelitis when there was no contrast with the incidence in the neighbourhood. He asked whether the incidence among the people served by septic tanks differed from that in the adjoining area, and whether the septic tank was responsible.

Dr. Stanley, in reply, said that there was little information on the sera collected from children in the immediately surrounding area where the septic tanks were faulty. The virus was not isolated from the tank; but children and housewives from the top of a hill near by had no type I antibody, and a fatal case had occurred in that particular area. Dr. Stanley was certain that septic tanks from other areas were not responsible for similar figures; they must relate to faulty septic tanks and not to septic tanks in general.

Dr. Murray, from the chair, said that Professor Miles had advocated the use of a safe vaccine when it was available. Those who had had the opportunity of reading both sides of the recent argument in the United States of America must have very serious reservations in their own minds about the Salk vaccine. In fact, there was a considerable volume of evidence that under the conditions in which it had been produced and tested in the United States there could be no guarantee that the whole of every batch would be completely safe. It was, of course, easy to allow one's heart to overrule one's head, particularly if one was associated with a large infectious diseases hospital in which there might be a few patients who had led a completely parasitic and very pathetic existence for years in a respirator. But it was necessary to try to preserve a sense

of proportion. They were dealing with a disease that never produced clinical illness in more than a small minority of those infected by it, and of that small minority more than three-quarters would recover without any real disability. They must beware lest, by allowing their judgement to be swayed by sentiment, they embarked upon a course that might result in the propagation of the very disease which they wished to destroy. They should always keep before them that portion of the Hippocratic Oath that bound them "to do no harm". If one-tenth of the effort that went into the production of the Salk vaccine could be put into the intelligent training of those who used it, there would be much less suffering and disability in the world.

Professor Miles, in reply to Dr. Stanley, referred first of all to the results obtained by Mr. Murphy. Professor Miles said he had seen them in Australia. However, there were quite substantial peaks in type I and type II antibody, whereas the level of type III antibody was low in all groups up to the age of fifteen years. Professor Miles said that Mr. Murphy had up to the present time investigated only the sera of children aged under fifteen years. In the 1937 epidemic Mr. Murphy had been looking for evidence that that was due, as in Adelaide, to type III virus. On the question of the immunity of the white population in the Northern Territory as opposed to the aboriginal population, Professor Miles said that one would expect the virus to spread among them. In the 1951 epidemic there were 20 paralytic cases amongst the white population to one amongst the aborigines. In the Northern Territory population the numbers were about equal; perhaps the white people were a little more numerous.

In reply to Dr. Mackenzie and Dr. McCloskey, on the subject of the distribution of cases in Victoria, Professor Miles said he did not think that results from South Australia could ever be directly collated anywhere else, because Victoria and New South Wales had larger populations and the pattern of immunity might be different. He had not seen Ferris's figures. He did not know much about what Ferris said at the A.N.Z.A.A.S. conference. Professor Miles said that his own remarks would probably apply to Western Australia and Tasmania.

To Professor de Burgh, Professor Miles said that the distribution of poliomyelitis in a vaccinated community depended on what sort of vaccine had been used. According to recent information, approximately 10% of batches of the best quality of Salk vaccine contained active virus, and of the others 25%. In monkeys, certainly, one would get intestinal excretion of virus if they were inoculated parentally; and if that was going to be the result of using vaccine containing a certain amount of active virus, one might be spreading a large amount of virus in the community. Since the type I strain which had been used was as virulent as one could find, there might be a substantial risk. Many people in Victoria disagreed, but it was generally thought that extreme caution should be taken in introducing a virulent virus even if it did protect the individual.

#### Disorder of the Blood in Industrial Medicine.

H. N. ROBSON (South Australia) read a paper on "Disorder of the Blood in Industrial Medicine". He said that an examination of the peripheral blood would usually be an early step in the investigation of a case of suspected industrial illness, and therefore gave a brief description of changes which might appear in the peripheral blood as a result of toxic damage. Professor Robson made an attempt to show how a detailed examination of the peripheral blood might indicate such a possibility, and perhaps give some indication of the nature of the offending agent. Professor Robson dealt with his subject under the following headings: (i) anaemia; (ii) red cell abnormalities; (iii) white cell abnormalities; (iv) platelet abnormalities.

G. C. SMITH (New South Wales) first discussed lead poisoning. He referred to the importance of blood tests in the routine control of people at risk, and said that haemoglobin estimations and stippled cell counts at least should be performed. He also referred to the importance of anaemia. Dr. Smith drew attention to the "normal" lead



intake and stippled cell count, and said that reliance should not be placed only on the stippled cell count in diagnosis. Regard should be had to the limitation of stippled cell counts. The anaemia was not due to lead if no stippled cells were present. Dr. Smith then referred to benzene, which he said might produce aplastic anaemia, leucopenia or thrombocytopenia. Several types of change had been reported. Haemolysis due to benzene had been described. Haemolytic anaemia and refractory anaemia were not so fundamentally different as had once been assumed. There was no specific blood picture, and a variety of changes was possible. The marrow might be hypoplastic, normal or hyperplastic. Atypical pictures might be due to solvent mixtures. There might be delay in the appearance of symptoms, and blood changes might occur. Referring to trinitrotoluene, Dr. Smith said it might be absorbed through the skin, by inhalation or by ingestion. It could produce cyanosis (methaemoglobinemia or sulphhaemoglobinemia), haemolytic anaemia, marrow damage leading to refractory anaemia, or toxic hepatitis. In relation to the effects of ionizing radiation, Dr. Smith said that there were differences of opinion about the value of a blood count. He stressed the importance of efficient monitoring of personnel. Dr. Smith then said that pigment changes might be produced by carbon monoxide. Cyanosis (methaemoglobinemia or sulphhaemoglobinemia) was produced by aromatic nitro and amino compounds, such as nitrobenzene, dinitrobenzene, trinitrotoluene and aniline compounds. Arsine was a haemolytic poison. Dr. Smith said it was important to make inquiries about exposure to toxic agents in all cases of blood disorder, whether the patients were male or female, and whether they were employed in industry or not.

D. O. SHIELDS (Victoria) said that it was possible to have severe lead poisoning in the absence of stippling and in the absence of anaemia.

H. M. L. MURRAY (Tasmania) said that it was impossible to overstress the need to watch for changes in the blood pigment as well as in the cell picture, in people exposed to toxic solvents. Those who relied only on the cell picture might find themselves suddenly faced with a dramatic situation which would make them realize that the factory precautions, upon which they had relied, were in actual fact defective.

J. ISBISTER (New South Wales) asked Professor Robson to say more about the estimation of faecal coproporphyrin and urinary porphyrin in the differential diagnosis of toxic from other haemolytic anaemias. Dr. Isbister stressed the importance of taking the patient's symptoms into consideration in the diagnosis of industrial poisoning, and of not relying solely on haematological tests. Dr. Isbister pointed out that it was desirable that public health departments should produce a list of toxic agents contained in proprietary products used by the public.

Professor Robson, in reply, said that he was convinced that in the past too little attention had been paid to the extraordinary variability in the response of the haematopoietic system to stimuli. Continuous supervision of individuals at risk was important. Single observations were of little value. Professor Robson said that he would regret the cessation of routine blood counts as an index of damage by radioactivity. The effects of excess radiation were so disastrous that blood counts and film monitoring were both important. Professor Robson said that the possibility of accidents in the industrial use of radioactive materials would in future necessitate additional precautions. When haemolysis was due to a toxic cause, liver damage was commonly also present.

#### Mental Health Aspects of Public Health.

ALAN STOLLER (Victoria) read a paper entitled "Mental Health Aspects of Public Health". He said that since acute illness had largely been controlled, the main problems of public health were concerned with the chronically sick, the aged and the psychiatrically ill. For the last, something had already been done in the way of primary prevention by controlling those psychiatric disorders which had an organic aetiology, and large-scale control of adverse

social situations and programmes of community education had contributed to secondary prevention of the psychogenic disorders. The figures for mental hospital patients did not necessarily represent the prevalence of a particular disorder in the population; there was need for constant epidemiological study of patterns of mental disorders in the community, use being made of the skills of public health, psychiatry, psychology, sociology, social work and anthropology. There was need for using psychiatric knowledge in present public health programmes, such as those relating to maternal and child welfare, tuberculosis, venereal disease, poliomyelitis and handicapped children. Total mental health programmes needed to be integrated with medical, social and educational services throughout all levels of community living. Responsibility for mental health was moving out of the sphere of the mental hospital towards the provision of adequate early treatment and of prevention facilities. Australia fell far short of what was desirable. Developmental programmes should be widely based and should look to provide adequate accommodation, early treatment, prevention, professional training and research. Public health, aided by the general practitioner, would have a vital role to play in any mental health programme in the future.

W. E. GEORGE (New South Wales) supported the views of Dr. Stoller on the mental effect of cancer detection centres.

B. B. TURNER (New South Wales) referred to the incidence of physical sickness in those committed to mental institutions.

Dr. Stoller, in reply, said that a question had been asked as to what could be imparted to doctors and to the public. Dr. Stoller urged that people should be given a better attitude to mental ill health. He stressed the importance of the family unit and the ill effects of family disruption, and mentioned the deprived child in the institution and the over-protective mother. Dr. Stoller said that cancer education could be harmful. A cancer phobia could be developed. Those in charge should know something of group psychology and avoid causing phobias. There was a relatively high incidence of physical illness in those entering mental hospitals.

#### The Notified Incidence of Rubella, Poliomyelitis and Infective Hepatitis.

E. FORBES MACKENZIE (Victoria) read a paper entitled "Observations on the Notified Incidence of Three Viral Infections (Rubella, Poliomyelitis and Infective Hepatitis), Victoria, 1954-1955". He said that rubella was found chiefly in infants, and few cases were reported in older children or adults, although a small outbreak had occurred among National Service trainees in camp; poliomyelitis was increasing in incidence, many young adults were affected, and more paralytic cases were occurring in children aged under five years; infective hepatitis had reached epidemic proportions, for no known reason. There was no evidence that the virus of hepatitis was milk-borne; it had been suggested that a new strain had been imported. Very few cases occurred in children aged under five years. The virus of rubella and poliomyelitis had been demonstrated in the naso-pharynx, but there had been no conclusive finding about hepatitis. Gamma-globulin was of the most value when used to protect parents once the disease had attacked a child.

Dr. Mackenzie, in reply to the discussion, said that he was not a virologist and he was glad to have the criticisms of the figures found in Victoria. He admitted that he did not know that the poliomyelitis in Victoria had changed from Type I to Type II, except as a matter of hearsay. He was glad that Dr. McCloskey had confirmed that information. Dr. Mackenzie was amazed at how the disease spread through a family so quickly. It appeared a poor commentary on home hygiene that a faecal-oral infection could spread through a family so rapidly. It seemed that a respiratory infection would easily spread in that way. Dr. Mackenzie went on to say that during the discussion remarks had been made about non-icteric infective hepatitis. He said that probably only 10% of cases were

icteric. He had no evidence that the younger children were not becoming infected, but the family cases which he had encountered showed a different pattern from that of poliomyelitis. About three weeks after a child became infected the parents were infected, and later still another member of the family. However, in poliomyelitis the quick spread to other members was quite different.

#### Pulmonary Tuberculosis in Relation to Occupation and Employment Conditions.

COTTER HARVEY (New South Wales) read a paper entitled "Pulmonary Tuberculosis in Relation to Occupation and Conditions of Employment". He said that occupational diseases were a prolific source of economic wastage and threw out a challenge to preventive medicine. The respiratory system, besides being the portal of entry for most of the industrial poisons, was the site of the so-called dust diseases; those could be simple or complicated by infection, the really sinister infection being tuberculosis. Dr. Harvey said that the relationships of tuberculosis to employment ranged much more widely than that, and formed a very complex subject. In occupations where there was contact with tuberculous patients, as in hospitals, the risk of infection had diminished greatly since B.C.G. vaccination had been introduced; routine X-ray examinations, Mantoux testing and improved hygiene must all be carried out. In certain occupations there was a high death rate from tuberculosis; the only proven factor there was silica dust or coal dust. After trauma to the chest, should tuberculosis have developed, it was regarded as compensable only if the original injury was compensable, or if it was caused by a compensable occupational disease, or if it arose through occupational contact with tubercle bacilli. Dr. Harvey emphasized that the sole contribution of trauma, *per se*, was to activate a latent tuberculous infection, except, of course, when a worker with a wound was handling tuberculous tissues or cultures.

Finally, Dr. Harvey discussed the problem of workers who had had tuberculosis. He said that many were discovered during mass X-ray surveys. Many employers refused to accept such people because of the attitude of workers' compensation courts, which might order heavy compensation because a worker had suffered a recurrence while engaged in completely non-contributory work, on the grounds of "aggravation". It was Dr. Harvey's opinion that such litigation should not occur, that the tuberculosis allowance provided by the Commonwealth Government made it unnecessary, and that the time was ripe for complete reorganization of the legislation governing tuberculosis and employment.

M. R. FINLAYSON (New South Wales) said that he agreed with all Dr. Harvey had said. However, there were two phases on which he wished to add some remarks—education and legal restrictions. Dr. Harvey would agree that great emphasis must be placed on the value of education in all occupational diseases, and particularly in regard to pulmonary tuberculosis, and also that that attack by propaganda, to be effective, must be comprehensive and must include the employee (and his union), the employer (and his insurer), the medical practitioner and the family. Propaganda in regard to the dangers and necessary precautions about pulmonary tuberculosis were, he believed, better than in most other diseases associated with employment, and in other countries reduction in lost time from that disease had been pronounced. He felt that a similar success could be expected in Australia if the present attack could be sustained.

Dr. Finlayson went on to say that to obtain the optimum of rehabilitation in workers affected by pulmonary tuberculosis, it was very necessary that some alteration in the compensation system should be made, so that in cases in which it was found necessary to submit to legal procedure to determine responsibility, the prolonged waiting, the nerve-racking experience of attending court and of hearing the clash of conflicting evidence (all rather debilitating and demoralizing for the patient) could be dispensed with, and so that the employer could reengage the worker when he had been rehabilitated without the heavy liability he

now had to accept. Dr. Finlayson wished that the recent conference or some other conference could evolve a system of cooperation which would eliminate that distressing mode of determination of liability. If that change could be effected by a conference of all those involved there was no reason why the great majority of tuberculous employees could not return to suitable work and become useful and happy economic units. He looked forward to that day.

A. H. PENINGTON (Victoria) stressed the need for a new outlook on the part of employers and fellow employees, and quoted as examples the Commonwealth Public Service and services which now employed people with a history of tuberculosis. Dr. Penington said that compensation risks would have to be accepted, for they were no greater with tuberculosis than with other generally accepted or concealed conditions. The present difficulties were the relic of the tuberculosis situation many years previously, and insurance companies, employers and fellow employees must be made aware of the change in prognosis.

A. L. LANGLEY (New South Wales) referred to Dr. Harvey's two final points—mass surveys and the rehabilitation of tuberculosis patients. Dr. Langley said that if mass surveys were to be carried out in industry, and if workers with active tuberculosis were to be taken out of industry until the condition was arrested, then provision should be made for industry to rehabilitate those patients. Persons with arrested disease should not be left to industry and turned to chronic invalids. The humane angle as well as the compensation angle had to be considered. Dr. Langley went on to say that when the division of tuberculosis saw fit to discontinue the tuberculosis allowance provision should be made for a softening-up period, during which industry should be subsidized to give people suitable work with rest periods up to the time of full employment. An extra hour with rest at lunch under supervision, or late arrival at work and early departure after work were suggested as means of rehabilitation.

D. B. ROSENTHAL (Victoria) said that whatever the patient's occupation, it had to be remembered that pulmonary tuberculosis was a communicable disease, and the industrial hazard was difficult to assess in relation to the source and to the opportunity for infection. Related cases of infection in a seminary had been found to be independent of vocational activity. Dr. Rosenthal mentioned his own experience of a conflict between medical opinions in a workers' compensation court in the case of a nurse. He said that the approach to such problems by the court was not realistic.

Dr. Harvey, in reply, said that in 1948 he had travelled in America and had picked up pamphlets dealing with employer-employee relationships, safety *et cetera*. Anyone could have those pamphlets. Dr. Harvey said that he agreed with Dr. Penington about the necessity for a change of outlook on the part of the Commonwealth Government. New South Wales was stricter, and he had a feeling that it would relax. Insurance companies were now accepting people with a history of tuberculosis. The human side mentioned by Dr. Langley was very important, and he was happy to say that employers with whom he had discussed the question had agreed. The greater the company, the more easily they could cooperate. The worker should avoid peak-hour traffic at night and in the morning, and many employers arranged that. As Dr. Woodruff had pointed out, the allowance was generous in South Australia. Other States should take note. More generosity was needed. With regard to the theological group mentioned by Dr. Rosenthal, Dr. Harvey said that he recalled a student working as a steward in an agricultural college. Dr. Harvey wrote to the doctor and asked him to watch the student, who was a sick man. However, he remained at work and he developed bilateral tuberculosis and cavitation. Dr. Harvey thought that he had better discuss that problem with Dr. Andrews. The student must have been a great danger.

In reply to Dr. Hughes, Dr. Harvey said that Dr. Hughes had spoken of a most difficult group. They had argued at great length, and they hoped that those things would soon

be a matter of history, and that compensation would not be necessary soon because of proper allowances. After congresses it was common for resolutions to go up. Dr. Harvey asked whether the meeting thought that the time was ripe for a high-level conference. At the present time they had over-employment. It might be the time for reaching a common agreement. Perhaps it could be put off.

#### Medical Supervision of Persons Exposed to Ionizing Radiation.

D. O. SHIELS (Victoria) read a paper entitled "Medical Supervision of Persons Exposed to Ionizing Radiation". He said that the manufacture of the atom bomb and of the hydrogen bomb had brought new hazards to those engaged in that new industry, but in industry generally and in other activities there had been an increase in the number of those exposed to ionizing radiation, due to extension of chest X-ray surveys to large numbers of people, to the increasing use of X-ray machines for a variety of purposes in industry, such as examinations for shoe-fitting, testing of metal parts for faults and so on, to the use of radioactive isotopes for discharging electrostatic charges in papermaking, to the measurement of thickness of sheets of metal or plastic, and to the use of radioactive paints in illuminated dials.

Dr. Shiels went on to point out that in the early days of operations concerned with radiation, control was exercised through testing the blood of those exposed. Later, when deficiencies in those criteria became apparent, the emphasis shifted to control of the environment, aimed at ensuring that no person was exposed to more than a certain dose of irradiation; the permissible standard, at first 1r per week, was then reduced to 0.5r, and recently to 0.3r. It was not certain that doses even smaller than 0.3r per week did not have detectable effects. In any case, even if environmental control did prove adequate to protect persons in highly organized and disciplined atomic energy projects, it would not be wholly adequate in industry generally; some medical control would still be necessary there.

Dr. Shiels said that the Factories Department of Great Britain had advised that for workers exposed to no more than 0.1r per week blood counts were not necessary; but if it could be shown that radiation of low intensity, while not producing effects on total and differential white cell counts, yet produced definite effects on the findings of certain other haematological tests, then the abandonment of these tests would be premature, at least until the effects were shown to have no clinical significance.

Dr. Shiels went on to say that the object of his paper was to describe new haematological tests, to show the effect of ionizing radiation on their findings, and to compare them with the existing tests. They comprised estimations of the ratio of monocytes *plus* large lymphocytes to small lymphocytes, the ratio of large lymphocytes to small lymphocytes, the percentage of lymphocytes containing granules in their cytoplasm, and the percentage of a certain type of monocyte. The estimations were made on persons who had been exposed to less than 0.3r of free-air irradiation per week, and were compared with estimations made on persons who had been exposed to no irradiation at all.

Dr. Shiels showed tables illustrating the ratios between monocytes *plus* large lymphocytes to small lymphocytes. Of 41 persons exposed to irradiation, 23 showed a ratio of over 2.5:1, while of 36 who had not been exposed only seven showed a ratio of over 2.5:1. In the whole group, of the persons who showed ratios over 2.5:1, 80% had been exposed to irradiation, and of the persons who showed ratios under 2.5:1, 69% had not been exposed. Dr. Shiels proved that the figures were statistically significant. He then gave the percentages of lymphocytes showing granules in their cytoplasm; of persons with less than 25% of granular lymphocytes 96% were in the exposed group, and of those with more than 25% of granular lymphocytes 76% were in the unexposed group. Those figures were also significant.

Dr. Shiels also showed that the percentages of lymphocytes with cytoplasmic granules, expressed as a fraction of the ratio of large to small lymphocytes, demonstrated a striking difference between the changes for the exposed group and the absence of changes in the unexposed group. He concluded by saying that the four new tests were sensitive and consistent in detecting effects of exposure to minor amounts of radiation, whereas the changes in values of standard white cell counts from the same persons were not statistically significant.

H. J. HAM (New South Wales) said that although he knew very little of the hazards of radiation in industry, he had been involved in that problem in medicine for a long time. He thought that it was in 1934 that a paper had been published on the effects of radium on human leucocytes in England, and in it the blood counts of various doctors, members of the medical staff, were given. He himself had figured in that under the name of Dr. "A", and was shown as presenting a typical example of the effects produced in a radium worker. He had been a radiotherapist ever since, and of course had regular blood counts. Apart from an occasional low leucocyte count he had shown no other changes, and his general health had remained good. Dr. Ham went on to say that it was true that the effects of radiation varied from individual to individual. He seemed to have heard a story of a pig which had been exposed to radiation during the atom bomb experiments in the Pacific. After its exposure it changed in various ways, one of which was that it learnt to swim, which it could not do before. Dr. Ham said that the changes described by Dr. Shiels might be very important, but he wished to ask him one or two questions. First of all, he wondered what those changes meant. If the worker's job was changed, did the blood picture return to normal? Dr. Ham presumed that it did. The point that he and his colleagues were sometimes faced with was to decide whether a worker should give up his job when he was likely to be exposed to radiation. Dr. Ham wondered whether those changes noted by Dr. Shiels, even with exposures of less than 0.3r per week, led on to worse changes. Another point was at what time of the day the blood counts in his series were performed. Dr. Ham wondered whether they were all done at the same time. Further, he wondered whether Dr. Shiels was certain that the subjects in group B had had no exposure to radiation. That brought him to the desirability, which had been expressed by the International Commission, of accumulating information from the doses received by individuals as a whole—in other words, to have a kind of passport or book for each person with details of all radiation exposures received during life. The amount of exposure sustained in ordinary X-ray examinations was not generally realized; for instance, an antero-posterior view of the ribs delivered 2.5r, an antero-posterior view of the pelvis delivered 4.7r, and a lateral view of the lumbar part of the spine delivered 12.4r. It was inferred by some people that all those things would have to be stopped, but Dr. Ham thought that those present would agree that that was impossible. A most important thing was care, and it should be laid down that only trained personnel should use radiation in medicine, industry or research. It was relatively easy in using X-ray equipment or radioactive substances to adopt procedures and routines so that the figure of 0.3r per week was not exceeded. Regular measurement of the exposure was obviously essential either by dental film or by ionization chamber. Referring to the exposure of children to X rays in shoe stores, Dr. Ham said that radiologists viewed that with some alarm.

Another speaker asked whether there was any relationship between exposure to radiation and the erythrocyte sedimentation rate.

J. H. GOWLAND (Victoria) said that in the last slide shown by Dr. Shiels, in which he had given a comparison of changes, there had been a difference of 27.4% in the eosinophile cells. Dr. Gowland asked why that was not a "scientifically significant" change.

Dr. Shiels, in reply to Dr. Ham, said that none of his subjects had been seriously affected. It was hoped to



follow them if necessary. Blood counts were not performed at any definite time of the day. With reference to the non-exposed group who had possibly had some exposure through odd chest X-ray examinations, it had not been possible to go into that. Such incidental exposure would also apply to the exposed group. Referring to exposure to X rays in shoe fittings, Dr. Shiels said that that was very important, and stringent regulations were in operation in Victoria. Children had been observed standing looking at their feet through the X-ray machine for two or three minutes while their mother talked to somebody. Dr. C. E. Eddy had tests made, and the regulations were the result. The question of a standard, by the application of which it could be decided whether a person should be taken off the job, was most important, but difficult. Dr. Shiels said that a good deal of work remained to be done on haematology in relation to radiation. He had performed all those tests over four years, but there was not a big enough field. What he wanted to do was to stimulate interest in the view that they had not yet seen the last of the value of haematology in regard to radiation. In reply to the question on the blood sedimentation rate, Dr. Shiels said that they had not done any work on that. He had seen very few references to the subject. It seemed more or less to have dropped out. Dr. Gowland had referred to eosinophile cells. Changes in those cells were not sufficiently significant, but the changes in the others were. The numbers were not so great as they would have liked. There was a suggestion in the results that the eosinophile cells might be worth following. A paper had recently been published in which a report was given of accidental exposure to radioactive substances of two workmen in a factory. A very large increase in the eosinophile cells was found, which lasted for three months before it returned to normal; so it appeared from that and from the present work that it might be worth while paying a great deal more attention to those cells than had been done so far.

#### Trends in Public Health.

D. W. JOHNSON (Queensland) presented a paper entitled "Trends in Public Health", which was read by Douglas Gordon. He said that in 1954 he had been awarded a travelling fellowship by the World Health Organization, which had enabled him to study the activities of public health departments in Europe and North America, and to assess new developments in the field of preventive medicine. He had returned convinced that the various State health departments in Australia, in general, were not properly organized to meet the needs of the people whom they served. There was little precise information on the frequency and major causes of ill health in Australia. To obtain that information, morbidity surveys were urgently required. Some of the causes of ill health revealed by morbidity surveys might be controlled or prevented. The emphasis in preventive medicine was passing from the environment to the individual, and health departments should organize their activities accordingly.

Dr. Johnson went on to say that in Australia public health activities at the local government level were weak, and insufficient use was made of the help that could be given by the social sciences and by voluntary agencies. It was suggested that the health unit system now widely used in Canada was adaptable to Australia, but its immediate adoption was impossible until more trained workers in public health were available. Dr. Johnson commended the National Health Grants Programme of Canada, and said that a similar programme in Australia would improve health services at all levels. Mental illness was the most challenging problem facing preventive medicine at the present time. Dr. Johnson predicted that there would be a rapid development of preventive psychiatry, which would be applied to all age groups in various ways. Accidents were now the chief cause of death among children, and they were far too common at other ages. Many were preventable, and accident prevention programmes should become an essential activity in all health departments.

Health departments in future should devote more attention to the effects on health of pollution of the atmosphere by industrial plants, and to the prevention of dangerous aerial pollution. Increased longevity had attracted attention to the high incidence of chronic diseases, and their study was a legitimate activity of a health department. Some of those diseases could be prevented, and by early diagnosis and appropriate treatment the socio-economic effects of others could be modified.

J. J. DONNELLAN (New South Wales) said that Dr. Johnson's paper expressed in a concise way the situation as it confronted public health workers today. Dr. Johnson's emphasis on the necessity for carrying out morbidity surveys was most timely, because it was by such means that public health workers could know what they were up against and could evaluate the results of any positive measures that were taken. Dr. Donnellan fully agreed with what Dr. Johnson had said with regard to the defects of central administration and local government administration, and was interested to hear how Canada was attempting to overcome those defects. Dr. Donnellan said that he would like to have asked Dr. Johnson whether he thought the Canadian idea better than the present proposals in New South Wales, which had already had a beginning—namely, decentralization of the central health authority by the formation of health districts with a population of eighty to one hundred thousand, in charge of a resident medical officer of health, with the necessary staff of skilled medical officers, dentists, nurses and health and food inspectors. The medical officer of health was, of course, subject to the central authority. That, Dr. Donnellan thought, would preserve uniformity and at the same time establish personal relationship in the community. He knew that some control by local bodies was desirable theoretically, but in his experience it did not work so well in practice.

Dr. Donnellan said that undoubtedly air contaminants now loomed very large and would continue to do so in the future, and there remained the old problems of waste disposal which had been aggravated in recent years with the increasing population and the inability of some public health services to keep pace with developments. Commenting on the question of air contaminants, Dr. Donnellan said that he felt very strongly that the leaders in industry did not sufficiently realize their responsibility to the public, because of the way in which they discharged noxious fumes and particles into the atmosphere with, in many cases, complete disregard for the health and comfort of the surrounding population. Many examples of that could be quoted.

In conclusion, Dr. Donnellan referred to one point which had not been discussed in the paper, but which he felt he should mention, as it might become a future problem. It was the question of the risk to the adult population following a high immunity rate against diphtheria among children. Dr. Donnellan believed that it was disturbing some authorities in America, as they had found that the percentage of antibodies in adults fell as the immunity rate among children rose. He did not know whether Dr. Gordon or anyone would care to comment on the point. He mentioned the fact that during the past year in New South Wales 19% of the cases of diphtheria had occurred in patients over the age of twenty years.

F. W. CLEMENTS (New South Wales) said that he wished to emphasize the fact that many of the trends outlined by Dr. Johnson called for a transfer of activity from central authorities to individuals. Up to the present much of the progress in public health had resulted from the improvements in water supply and food handling, the effective disposal of wastes and sewage, and mass immunization campaigns, which had been inspired or carried out by State or local authorities. Future improvements would depend upon the actions of individuals working to improve their own health. To do that effectually they would require adequate motivation, for which new techniques must be developed by health authorities. Greater use must be made of the social scientist. The health worker must go out among

the people, and the social scientist could help in the development of effective methods of stimulating interest and activity in the public in those new problems.

#### Field Results of Immunization with Pertussis Hæmagglutinin (H.A.P.A.).

D. W. RANKIN and S. FISHER (Victoria) presented a paper on field results of immunization with pertussis hæmagglutinin (H.A.P.A.). It was stated that the development of H.A.P.A. (hæmagglutinin, aluminium phosphate adsorbed) had been outlined in a paper read before the Australasian Medical Congress (British Medical Association) in 1952. From then till early in 1955 H.A.P.A. had been issued to five Victorian municipalities for use in their immunization campaigns, and to a number of practitioners in different States for use in their practices. Separate investigations were carried out to survey results obtained in municipal campaigns and in private practices. Circulars were sent to private doctors. English workers had found that in home contacts with clinical cases 90% of unprotected children contracted pertussis; 35 home exposures were recorded in the replies received by Dr. Rankin and Dr. Fisher. Nineteen of those contacts had been immunized; two of them contracted pertussis. Of the 16 unimmunized children, 14 developed the disease.

In the municipal campaigns, children aged under five years were considered; the period covered was from July, 1952 (when pertussis was made notifiable in Victoria), to the middle of 1955. Cases, obtained mainly from notifications, were checked against council immunization records and assigned to the "immunized" group if the patients had received the full course of two injections of H.A.P.A. or to the "other" group if they had not. The number of children at risk in 1954 was obtained from the Commonwealth census taken in that year. The number of children at risk in the years before and after 1954 was estimated from the 1954 census figures, by the use of trends derived from the numbers of school entrants obtained from the Education Department in Victoria. The numbers of children who contracted pertussis against the number of child-years observed were: City of Melbourne, 4 in 3166 (immunized), 139 in 17,032 (others); Fern Tree Gully, 1 in 876 (immunized), 11 in 3478 (others); Fitzroy, 2 in 573 (immunized), 34 in 4914 (others); and Brunswick, 2 in 305 (immunized), 20 in 4639 (others); in all, 9 in 4920 (immunized) and 204 in 30,963 (others). The total rates per 1000 child-years were 1.83 and 6.78 respectively. The fifth municipality, Malvern, was excluded from the survey as there were insufficient cases. Of the four areas considered, H.A.P.A. proved efficient in three and unsatisfactory in one (Brunswick); on the summed figures it was satisfactory. For a number of reasons, which were discussed, it was considered that the method of analysis probably loaded the results against H.A.P.A. Accurate estimation of the protective efficiency of H.A.P.A. was not possible, but it was concluded that the incidence of pertussis in the group fully immunized with H.A.P.A. was significantly lower than in the group of children not immunized against whooping-cough, immunized with other agents or immunized partially with H.A.P.A.

The survey did not indicate the relative protective efficiency of H.A.P.A. and bacterial vaccines, but there was no reason to believe that H.A.P.A. was not at least as good as an average vaccine. Moreover, only two injections (0.25 millilitre each) were required, and there was a relative freedom from side effects.

The relationship between field results and laboratory assays was then discussed briefly. Finally, the cooperation of numerous doctors and others, which made the survey possible, was gratefully acknowledged.

P. M. DE BURGH (New South Wales) said that the problems raised in the evaluation of pertussis vaccine illustrated the difficulties of using other species for testing. In the case of pertussis there was no animal other than man and possibly monkeys in which the disease whooping-cough could be produced. Until there was certainty about what was the bacterial component concerned in virulence in man against which it was desirable to have protective antibodies, it appeared difficult to imagine a satisfactory labora-

tory test. Professor de Burgh said that Dr. Fisher had made progress towards identification of the important factor, but the full answer was not yet available; so the most reliable assay of pertussis immunization was field trial in man. In the disease pertussis the effect of immunization was more difficult to evaluate than in, say, diphtheria. The small field trial looked promising, and it was to be hoped that the results would be reproduced in trials on a larger scale.

#### A New Ætiological Factor in Endemic Goitre in Tasmania.

F. W. CLEMENTS (New South Wales) said that, as a sequel to a goitre survey in Tasmania in 1949, arrangements had been made for children to be given, once a week, a tablet containing 10 milligrammes of potassium iodide. A follow-up survey in 1954 by the same investigator revealed that, contrary to expectations, the incidence of goitre was not reduced but significantly increased, especially in the younger age groups, and the rates for boys approximated more to the rates for girls.

Dr. Clements pointed out that although the distribution of tablets had been far from perfect, it was sufficiently good in many schools to have been an effective prophylactic when compared with the use of the same method in Canberra. He had taken particular care to check his method in the second survey when he found that the incidence was higher. The change in incidence was not uniform throughout Tasmania. The rates in the second survey were significantly less in some districts and significantly greater in other districts.

The improvement in some areas and the reduced incidence among older children confirmed the view that a large amount of the endemic goitre was due to iodine deficiency. The failure of the iodide prophylaxis, especially among young children, led to the formulation of the hypothesis that there was present in milk a goitrogenic factor, the source of which was various members of the brassica family used for cow feed, especially in the late autumn and winter months.

The increase in the incidence of goitre in the five years between the surveys could be associated with the threefold increase in the amount of chou-mollier grown in that time. That was a forage crop of the brassica family. There had also been a great increase in the consumption of milk in the same period, following the introduction of the Commonwealth Government's free milk scheme.

Samples of milk from cows fed appreciable amounts of chou-mollier were tested in a number of ways. An aqueous extract was obtained which apparently contained a substance with a maximum absorption band at 246 mμ, and which interfered with the uptake of radioactive iodine in human volunteers. The duration of the arrest of uptake of  $I^{131}$  by the extract from one gallon of milk was from two to three hours. Tests with three pints of milk taken over about one and a half hours after a fifteen-hour fast arrested the uptake of  $I^{131}$  for at least five hours.

Dr. Clements discussed the possible ways in which the substance or substances in the milk affected iodide metabolism.

He said that the study was continuing, but results to date supported the original hypothesis that milk in Tasmania contained a goitrogenic substance which might be responsible for a significant amount of endemic goitre in that State. It was suggested that the same explanation might be applied to the residuum of "incipient" goitre present in New Zealand after thirty years' intense propaganda for iodide prophylaxis and to the rise in endemic goitre in Europe during the war.

H. M. L. MURRAY (Tasmania) said that when they had first discovered that iodine prophylaxis was not successful in all districts, they had obviously had to investigate the possibility that the tablets given to school children did not, in actual fact, contain potassium iodide. Analysis of a number of tablets selected at random showed an average content of 9.97 milligrammes of potassium iodide per tablet. In the actual investigation they had had all the

trouble usually found in field work. For example, two samples of milk from cows not fed on chou-mollier gave exactly the same results as that from cows fed on chou-mollier. When they followed samples back, they found that the cows had grazed on pastures heavily contaminated with cruciferous weeds, and also, owing to the illness of the farmer, they had had access to a field of turnips. Dr. Murray went on to say that in view of the association between the occurrence of endemic goitre and an increased mortality rate from thyrotoxicosis, they were faced with a public health problem of considerably more than academic interest; and it was apparent that, if Clements's hypothesis was sustained, a great deal of thought would have to be given to agricultural practices in future. Dr. Murray did not think that anyone could suggest a suitable substitute for cow's milk as a diet for children, and therefore it would be necessary to change the feeding habits of dairy herds, so as to produce milk that was safe.

#### Pesticides and Their Toxicology.

G. H. McQUEEN (South Australia) read a paper on "Pesticides and Their Toxicology". He said that the demand for more food to feed the increasing population of the world had stimulated research into improved methods of production and conservation. As a result, a wide variety of chemical substances to prevent and control living organisms that adversely affected food in its various phases had been discovered and used. Those substances often also adversely affected human beings by contact, and/or after absorption into the body through the skin, from the inhaled air in the lungs and from the intestinal contents. Dr. McQueen said that pesticides might be defined as products which would control any form of virus, plant or animal life, but not if they were causing disease in the human body. "Acute toxicity" was produced by a single dose of the substance causing the signs and symptoms of poisoning; "chronic toxicity" resulted from small doses over a long period. "LD50" was a dose that would kill 50% of the population to which it was given; different percentages could be stated in the same way. "Tolerance dose" was the safe upper limit for a residue on a foodstuff.

Pesticides were grouped into metallic compounds, halogenated organic compounds, phenolic compounds and organic compounds containing phosphorus. In the metallic group the toxicity of pesticides which owed their pesticidal effect to arsenic, lead and mercury was discussed. Methyl bromide and D.D.T. were taken as examples of the halogenated organic pesticides, chlorine being the halogen concerned in one case and bromine the halogen concerned in the other.

Dr. McQueen went on to discuss in detail the toxicology of the two most important members of the phenolic group, pentachlorophenol and dinitro-ortho-cresol, and also the toxicology of the organic phosphorus-containing compounds. Parathion, the most commonly used member in Australia, was an example of that group, and Dr. McQueen made reference to where the other more important members varied from parathion; the variations in most cases were of degree only.

Dr. McQueen, in conclusion, discussed the toxicology of sodium fluoroacetate. He said that that substance, in common with many other pesticides, acted as an enzyme inhibitor, but it did not fit into any of the groups already discussed.

D. O. SHIELS (Victoria), in opening the discussion, referred to the extravagant claims made by sellers of

various pesticides and appliances about the effectiveness and non-toxicity of their products. He drew attention to the development of resistant strains. Dr. Shiels said that severe burns could be caused by exposure to the vapour of methyl bromide, and that methyl bromide was very toxic. The inhalation of 100 to 500 parts per million for some working days had affected 34 people, and probably another 20 people were affected but did not seek medical attention. Five months later four were classed as permanently disabled and six as temporarily disabled. Dr. Shiels went on to describe the use of an agent (aluminium phosphide) which on exposure to moist air caused the evolution of phosphine. He said that that method of fumigation of wheat in bulk was very satisfactory. Pellets consisting of the agent united with carbonate were inserted below the surface of the wheat. Since the evolution of the phosphine was slow, there was plenty of time for the operator to move away before an excessive concentration developed. The solid residue after fumigation was harmless. Dr. Shiels finally mentioned the recent development of insecticidal resins. He said that an insecticide such as D.D.T. or lindane was incorporated in the resin, and after the resin had set a fine bloom of minute crystals of the insecticide was formed. When this was washed or brushed off it was reformed from the interior of the resin. The resin should not be used on broad surfaces such as walls, but only along cracks, in holes, along edges *et cetera*. More widespread use was wasteful and might be dangerous. The method had been of value in hospitals and in pilgrim ships.

#### Medical Practice in Heavy Industry.

H. O. LEGGO (New South Wales) read a paper entitled "The Role of Medical Practice in Heavy Industry in Australian Conditions". He said that his paper covered the working of an iron and steel works. A wide range of processes was involved, and the industrial medical practitioner was primarily concerned with the physical and mental fitness of employees. Every effort was made to foster the relationship between patient and doctor. First aid was part of the service to be rendered, but Dr. Leggo said that he found most beneficial the principle of "first treatment"—the nursing sisters and ambulance officers within the medical service were taught to carry out definite routines on full treatment lines; for example, with such a service splinting on the spot was unnecessary, and manipulation and discreet traction had taken its place. That required the continuous availability of the medical officer.

Dr. Leggo then said that a full medical history was necessary in assessing the fitness of an employee, and a job analysis was most useful. To maintain or improve the fitness of employees, the principles of preventive medicine must be applied fully. Routine examinations were encouraged. A safety department was kept busy maintaining safety precautions. When an employee had had an accident or some illness, it was most important he supervise his full rehabilitation. To facilitate all those measures it was essential to keep full records and to make many environmental surveys. The industrial practitioner could have a positive and absorbing interest in an important field of medicine.

J. L. STOKES (South Australia) said that the question of rehabilitation should be ventilated on a high level with Government, employers and unions, in an endeavour to reach some understanding and acceptance of the principles involved, and particularly in an attempt to break down any resistance to those principles.



## Section of Radiology and Radiotherapy.<sup>1</sup>

President: B. L. W. Clarke, M.B., B.S., D.M.R.E., F.R.A.C.P., Queensland.

Vice-Presidents: D. G. Maitland, B.Sc., M.B., B.S., D.R., F.C.R.A., New South Wales; K. H. Hallam, B.A., M.B., B.S., D.M.R. & E., F.C.R.A., Victoria; H. A. McCoy, M.B., Ch.M., F.F.R., D.M.R.E., F.C.R.A., South Australia; M. M. Craig, M.B., Ch.B., Western Australia.

Honorary Secretary: Dr. D. B. Wightman.

### President's Address.

B. L. W. CLARKE (Queensland) took as the subject of his president's address "Evolution of Radiology". He said that the announcement by Röntgen of his discovery was met with some curious reactions, such as the selling of X-ray-proof underclothing for women, and the bringing down of laws forbidding the manufacture of X-ray opera glasses.

The early machines were crude—the first machine in Brisbane was installed in 1896 at a total cost of £5 17s. 9d. The original exposure for a hand was thirty minutes. Gradually there was mechanical progress, and medical appreciation of the value of X rays developed. Great advances were in fineness of screen grain, the development of films instead of glass plates, and the devising of more stable emulsions; then intensifying screens were developed, followed by the interruptless alternating current transformer, and the Coolidge tube. Next was the Bucky diaphragm. With those, the study of bone pathology and chest radiology became easier. Nowadays all branches of medicine depended greatly on X rays.

Dr. Clarke then referred to radiotherapy, which had developed to a very accurate degree. He concluded with a brief account of the College of Radiologists of Australasia.

### Placental Localization and Calcification.

E. A. BOOTH (New South Wales), discussing placental localization and calcification, said that in cases of ante-partum hæmorrhage especially, localization of the placenta was most important in regard to future treatment. Material from the Queen Victoria Maternity Hospital, Adelaide, and the King George V Hospital, Sydney, was reviewed. The most suitable methods of localization were the "soft tissue" method aided by placental calcification, which was fairly commonly seen from thirty-two weeks onwards. At the King George V Hospital the "soft tissue" methods of Reid were combined with a "calcification" technique similar to that of Blair Hartley. It was important that the bladder and rectum be empty. Antero-posterior views, lateral views, right and left oblique views (with the patient recumbent) and lateral views (with the patient standing) were taken. Localization was often possible on those alone. If not, "postural" skiagrams were taken, aimed at excluding amniotic "lakes" *et cetera*. The use of the Bucky diaphragm with grid gave a "cross-hatch" effect. Localization was mainly carried out in cases of suspected *placenta prævia* in attempts to reduce infant mortality (approximately 18%), and possibly save hospital bed space. Localization was more difficult in the lower segment because of overshadowing by the pelvis.

Dr. Booth then attempted the classification of *placenta prævia* into four types, and said that the method of treatment might depend on the typing. In 1932 Staveley had mentioned calcification as a means of localizing the placenta. The calcification was usually fine, lace-like and peripheral. In the majority of cases it was sufficient to make the placental tissues rather more dense than the surrounding soft tissues. The degree of calcification increased as term approached. At the Queen Victoria

Maternity Hospital the calcification in the placenta had been detected much more since the adoption of a technique recommended by Hartley in 1954. The factors were: 65 to 70 kilovolts, 400 milliampères, 36 inches, 0.5 second; standard films and screens were used for the prone position, and lateral films were taken with the patient in the recumbent position. The bladder and rectum had to be empty. The lateral skiagram with the patient standing was taken with 120 kilovolts and longer exposure; a coned film (lateral or oblique) was then taken over the suspected placental site. Further oblique films *et cetera* were taken when necessary. Absolute immobilization was attempted by ruthless application of a broad compression band. The films had to be of high technical quality, and viewed on a good viewing box, which could be screened to varying sizes, and also with a spotlight incorporated.

Dr. Booth went on to say that localization was more difficult in transverse lie and breech presentation, if the belly was pendulous, and might be misleading in multiple pregnancy or pelvic tumour. Even though the main placenta was in the upper segment, a succenturiate lobe might be present in the lower segment. The junction of the upper and lower segments was taken as approximately at the pelvic brim in the last three months of pregnancy, and before the onset of labour. The diagnosis of *placenta prævia* depended on the demonstration of placental tissue in the lower segment by calcification, supported by displacement of the presenting part. Asymmetry of the fetal head in the pelvis warranted further investigation, especially after ante-partum hæmorrhage, even if the bulk of the placenta was in the upper segment. Placental calcification was a certain means of localization. It was found in 20% of cases at the Queen Victoria Hospital from thirty weeks of gestation. Localization was possible in eight or nine cases of every 10. It was hoped that with more experience, better figures would be achieved. The method was simple, and did not require the instrumental examination of the patient. The greatest error occurred in the minor degrees of *placenta prævia*; but fortunately they were the least troublesome clinically, and such patients often had a normal labour.

### Radiological Features in Plain X-Ray Films of the Skull.

B. P. CAHILL (New South Wales) read a paper entitled "Radiological Features in Plain X-Ray Films of the Skull". He said that there were various methods available to the radiologist in performing plain radiographic examination of the skull. He proposed to indicate in his paper what those techniques were, and how they might be employed to demonstrate cranial and intracranial abnormalities. Dr. Cahill said that it was desirable to have some routine which would provide an adequate basis for studying the average patient sent for radiological examination of the skull. That routine, which had been suitably called a "skull survey", should employ constant projections which were not subject to appreciable variation, at least in so far as any one observer was concerned. Dr. Cahill put forward a method employing four projections as a routine. It was recognized that such a method should be reasonably flexible and capable of modification according to the circumstances, and examples were given of the manner in which that might be effected. Nevertheless, the value of the submento-vertical or basal view was particularly stressed, and it was

<sup>1</sup> The meetings held by the Section of Radiology and Radiotherapy with the Section of Public Health and Industrial Medicine, the Section of Orthopaedics, the Section of Pædiatrics, and the Section of Oto-Rhino-Laryngology have already been recorded.

strongly suggested that that projection should be included whenever possible in plain radiological examination of the skull.

Dr. Cahill went on to say that there were additional techniques available which could be used to advantage in various circumstances, and in many instances it was imperative that they should be employed. Some of the indications for those extra projections and radiographic refinements were discussed. Dr. Cahill stressed the desirability of taking lateral films with a horizontally-directed X-ray beam in certain conditions, and mentioned the use of tangential views, stereoscopy and tomography. He then discussed the interpretation of plain films of the skull. He considered that some plan of inspection was essential for correct interpretation, and set out the following features which could be observed in films of adequate quality: (i) the cranial vault, (ii) the base of the skull, (iii) the *sella turcica*, (iv) the petro-mastoid regions, (v) the facial bones, including the orbits, (vi) the paranasal sinuses, (vii) calcification, if any, particularly intracranial, (viii) the soft tissues, (ix) the upper cervical part of the spine. Dr. Cahill then discussed various abnormal appearances which were encountered, on the basis of that outline. He mentioned some of the more usual causes of those abnormalities, and noted major clinical significance. He emphasized that in some instances direct evidence of abnormality might not be as important as indirect evidence of associated intracranial disorder.

Dr. Cahill discussed at some length various changes that were found in the cranial vault and base, and drew particular attention to certain conditions, such as aqueduct stenosis, that were developmental in origin, and gave rise to rather distinctive appearances. The radiological findings in juvenile subdural haematoma were mentioned. The *sella turcica* was discussed in some detail, and an endeavour was made to indicate the difficulty that might arise in assessing changes that were seen in that region. Dr. Cahill said that intracranial calcification was a large subject, and restricted his comment to relatively few remarks.

#### Tomography.

ALAN R. COLWELL (New South Wales) read a paper entitled "The Evaluation of Tomography". He said that enough time had elapsed since tomography had been introduced to enable an opinion to be formed on its value. Fundamentally tomography was a method of blurring out the overlying structures, so that unless there were contrasts in densities, it offered no help. It was of value in investigating the lungs, skull, temporo-mandibular and sterno-clavicular joints, hip joint, spine and kidneys. It was time-consuming and required much skill. In brief, it was a method of projecting, radiographically, plane sections of solid objects, by moving the X-ray tube in one direction and the film in the opposite direction simultaneously by means of a connecting system which rotated about an axis lying in the plane of the section to be projected.

Dr. Colwell then explained the technical details of the method, and demonstrated them by a series of slides.

#### Cutaneous Malignancy in Queensland.

A. G. S. COOPER (Queensland) read a paper entitled "Reflections on Cutaneous Malignancy in Queensland". He said that to the radiotherapist special interest was attached to the treatment of skin cancer for several reasons. First, response to treatment given could be followed and observed closely, and secondly, with careful management the cure rate could be made to approach the 100% mark. The cancerologist often felt that the eventual cure of malignant disease would be developed from observations made in the treatment of superficial malignant disease. In Queensland there was an additional stimulus to the radiotherapist arising from the high incidence of that condition. Of new patients suffering from malignant disease who reported at the main centre of the Queensland Radium Institute, 70% had skin cancer. Dr. Cooper mentioned age and sex incidence and aetiological factors, stressing the effect of sun exposure. He quoted Hueper in regard to the varying incidence of skin cancer in several States in the United

States of America, and his endeavour to link that with the estimated intensity of sunlight in those States. Dr. Cooper then gave a brief description of cutaneous carcinomata and their differential diagnoses.

Dr. Cooper then dealt with the treatment of cutaneous carcinoma, and described the method adopted in 1944 and used since as a routine treatment policy. He said that, briefly, the basis of that treatment depended on the clinical estimation of thickness of the lesion with the delivering of a calculated minimum tumour dose to the base of the lesion. That minimum tumour dose was selected at 4000r in ten to fourteen days for rodent ulcer and 4500r over fourteen days for squamous cell carcinoma. It was pointed out that that régime agreed very closely with the work of Strandquist published first in 1943. Dr. Cooper mentioned that the results obtained in the application of that treatment method over a period of years had been judged satisfactory by a staff of radiotherapists, and as far as statistical assessment had been possible, survival figures were extremely satisfactory. Queensland patients tended to belittle the importance of skin cancer, and a proportion of patients failed to attend for subsequent follow-up examinations when complete cure had been obtained. Up to date the number of staff employed on progress inquiries at the Queensland Radium Institute had not been adequate to cope with the colossal task of tracing 14,000 patients treated over the last twelve years. Dr. Cooper finally mentioned the mortality figures obtained from the Government Statistician's office, which indicated that the large majority of untraced patients had survived.

W. W. LEMPRIERE (Victoria) said that it was his practice to avoid local treatment for hyperkeratosis as far as possible, as in many cases the condition responded to general supportive treatment of the patient. Dr. Lempriere also said that he favoured observation of established rodent ulcers in aged patients, and thought that in all cases plastic surgery was preferable for lesions in the naso-labial fold or on the *ala nasi*.

J. J. WITTON FLYNN (New South Wales) said that in his opinion Dr. Cooper's paper should have been read before the Section of Dermatology, and that a combined meeting of the Section of Dermatology and the Section of Radiology and Radiotherapy should be arranged in any ensuing Congress. Dr. Flynn commented on the training of junior medical officers in accuracy in the diagnosis of malignant disease of the skin, and said that he had no faith in statistics, and thought that the number of deaths from skin cancer quoted by Dr. Cooper must be exaggerated. He thought that the lesion shown in one colour transparency was an acanthoma instead of an epithelioma as demonstrated.

J. C. BELISARIO (New South Wales) differed from Dr. Cooper's statement about the relative sensitivities of squamous and basal cell skin lesions. Dr. Belisario considered that each responded equally well to a dose rather less than 4000r.

R. F. A. BECKE (New South Wales) said that in the past eighteen months he had paid particular attention to the end results of treatment of basal cell carcinoma on or near the inner canthus of the eye. Superficial X-ray therapy was certainly satisfactory, but his observations suggested a higher rate of cures by plastic excision as a primary treatment. The results from excision were certainly superior cosmetically.

R. KAYE SCOTT (Victoria) asked for a reference relating to the high mitotic rate mentioned for basal cell carcinoma and the arrest in metaphase.

Dr. Cooper, in reply to Dr. Lempriere, said that when the patient had a short expectation of life, it would occasionally be justifiable to keep rodent ulcers under observation. With regard to lesions in the naso-labial fold and on the *ala nasi*, Dr. Cooper could not agree that plastic surgery was preferable to radiotherapy as the primary method of treatment. In reply to Dr. Flynn, Dr. Cooper said that in regard to the histological resemblance between Paget's disease and Bowen's disease he had only been repeating a statement in R. A. Willis's "Pathology of

Tumours" (1948), at page 288. The statistics in question had in the majority of cases been double checked with records held at the Queensland Radium Institute. It was to be expected that there would be some selection of patients, with the result that patients with advanced lesions attended institutions rather than dermatologists in private practice. The lesion on the ankle shown on the screen was certainly a squamous epithelioma, as the same patient had later developed inguinal node metastases. Dr. Cooper welcomed the suggestion that a combined session should be held at some future meeting.

Dr. Cooper, in reply to Dr. Belisario, noted that his dosage level differed somewhat from the procedure adopted in Queensland.

In reply to Dr. Becke, Dr. Cooper said that it was his routine practice to treat rodent ulcers in the inner canthus as in other sites. Lachrymal duct stenosis was preventable in the majority of cases by probing within four to six weeks after treatment.

In reply to Dr. Kaye Scott, Dr. Cooper said that the reference was contained in R. A. Willis's "Pathology of Tumours" at page 274; he had also received a personal communication from Dr. A. Pound, Director of Pathology, Brisbane General Hospital.

#### Genetic Effects of Radiation.

MARY THORNTON (Victoria) read a paper on the genetic effects of radiation. She said that the date on which it had been completed was June 29, 1955, and that it represented a summary of what she had been able to read up to that date. The subject was producing more literature almost weekly. She considered the question of danger to the human race from test explosion of so-called "hydrogen" bombs, and took note of the fact that it had not yet been proved that such tests were harmless to succeeding generations. Dr. Thornton presented a short historical study of work on the genetic effects of radiation during the last half-century, and mentioned causes, other than X rays, of changes in the genes. She made an attempt to sum up theories as to how those forces acted on body cells, and briefly sketched the anatomy and physiology of body cells. Dr. Thornton then pointed out that experiments on the large chromosomes of the fruit fly *Drosophila* and of the plant *Tradescantia* were not necessarily indicative of what was happening to man, though recessive changes over a wide range of organisms suggested the likelihood of similar effects. She considered the unavoidable risk of genetic changes in patients requiring irradiation of pelvic organs, and recommended that until more was known in that direction, doses should be kept to a minimum and the genital organs protected whenever possible. Dr. Thornton mentioned as only slight the risk to X-ray workers under normal civilian conditions when recommended standards of precaution and protection could be observed. Finally Dr. Thornton urged that atomic scientists should devise some way, other than practical demonstration, of testing the efficiency of the latest fission-fusion-fission bomb.

H. J. HAM (New South Wales) said that the subject of Dr. Thornton's paper was a matter of great interest, but as she had said, a matter of great difficulty. The effect of radiation varied with the individual. Some work had been done recently on the progeny of radiologists as compared with other medical men. A worker in America had reported on that, and had found no increased incidence of congenital abnormalities. As Dr. Thornton had well said,

the recessive mutations might not show themselves for a considerable time, possibly a hundred years. There was much more exposure from X-ray examinations than was often realized; for instance, a lateral view of the lumbar part of the spine gave about 12.5r on the skin. However, Dr. Ham thought that they had to be sane about it. At that stage he did not think that they should stop all X-ray examinations. In his opinion the use of radiation should be limited to the least possible exposure. He thought that their specialty should take a lead in that matter.

K. H. HALLAM (Victoria) said that all radiologists should be fully aware of the dangers mentioned. He was convinced that in the daily practice of radiology, diagnostic X-ray exposures were often given unnecessarily, and the sum total of radiation to the patient was thereby increased.

B. L. DEANS (Victoria) said that it was a scientific duty for radiologists to do something in the matter and to bring it under notice in the right quarters.

K. H. CLARKE, B.Sc. (Victoria), said that Professor Catcheside, of Adelaide, had done a great deal of work on animals and had tried to apply his results to human beings. He found that 100r of whole body irradiation produced one genetic death in 20. Mr. Clarke said that if one could apply that to human beings, one found in Australia a dose of irradiation of 0.1r per year; if one assumed that the effect on the genes was the result of the cumulative radiation received over the first thirty years of the subject's life, 0.1r per day being the average exposure per person from diagnostic X-ray examinations, then they received 3r in thirty years, and that could produce 1000 genetic deaths a year in Australia (on a population basis of 9,000,000). There would be a correspondingly large number of malformations.

#### The Use of Compensating Filters in Radiotherapy.

K. H. CLARKE (Victoria), in a paper on the use of compensating filters in radiotherapy, said that when fields having long axes were employed in X-ray techniques, the natural curvature of the isodose curves could result in a very considerable fall-off in dosage along the axes of the irradiated area. In order to overcome that fall-off, suitably shaped aluminium filters could be introduced into the X-ray beam, so that the intensity along the central axis was reduced relative to the intensity at the edges of the field. Because the dosage delivered to tissue was a complex addition of primary and scattered radiation, the design of such compensating filters was not straightforward, and their construction was the result of trial-and-error ionization measurements. For a given set of operating conditions, a particular filter would only flatten the isodose curve at a particular depth, and furthermore, where compensation was made at depth, hot spots occurred at the surface. Those hot spots were small in area and could be made acceptable to radiotherapeutic practice. The introduction of such filters into the beam caused a reduction in the surface dose rate, but it was shown that that was not excessive, particularly in terms of the overall treatment time. The filters also caused some hardening of the X-ray beam, but that was quite small.

Mr. Clarke discussed the use of the filters in the X-ray treatment of carcinoma of the breast. He showed that by a combination of compensated tangential fields and anterior strip fields to the chest wall, a very uniform dose could be delivered to the whole of the irradiated area, and also to the whole of the internal mammary chain of lymph glands.



## Section of Rehabilitation and Physical Medicine.<sup>1</sup>

*President:* C. W. Anderson, M.B., B.S., Western Australia.

*Vice-Presidents:* D. O. Longmuir, M.B., B.S., Victoria; S. G. Nelson, B.Sc., M.B., B.S., M.R.C.P., M.R.C.P.E., F.R.A.C.P., New South Wales.

*Honorary Secretary:* Dr. B. G. Wade.

### President's Address.

C. W. ANDERSON (Western Australia) entitled his president's address "The Scope of Rehabilitation in Australia". He said that rehabilitation was the satisfactory replacement of an individual within his familiar surroundings after an illness, and that was the aim of good doctoring. It demanded skill, patience and wisdom. For some patients there were governmental and voluntary agencies, but others had nobody concerned with them—in Western Australia the most obvious of those were the epileptics. The Rehabilitation Service of the Commonwealth Department of Social Services had been established in 1948, and it cared for invalid pensioners, those receiving unemployment or sickness benefits, certain private patients, workers' compensation patients, and the fourteen to sixteen year old group. The service also cooperated with the state tuberculosis control services. Voluntary organizations cared for patients with poliomyelitis and spastic paralysis, and mentally retarded and crippled children.

Dr. Anderson then said that recently there had been formed the Commonwealth Ministry of Labour Advisory Council, composed of employers and trade union officials, with the object of giving the physically handicapped an opportunity to do the work they were able to. It was probable that many organizations were not cooperating in that work, and rehabilitation was haphazard and uncertain. It was desirable to coordinate all organizations on the Commonwealth and State levels, with medical and administrative representatives and practising medical men, together with employee and employer representatives.

### Rehabilitation and Rheumatism.

RODNEY I. MEYERS (Queensland) read a paper on rehabilitation and rheumatism, based on experience obtained in post-graduate work at the Mayo Clinic, and in a tour of certain leading centres of rehabilitation and of rheumatology in the United States of America, in Toronto, in Copenhagen, and in Britain. Dr. Meyers considered the terms "physical medicine" and "rehabilitation", and submitted that, in regard to rehabilitation, the term "physical medicine" could perhaps be discarded. He pointed out that there should be close and informed medical supervision of all aspects of the rehabilitation of a patient, from the onset of the patient's injury or illness until he had returned to a suitable normal activity. That opinion was confirmed by the findings of an expert committee of the British Medical Association in Britain. Dr. Meyers went on to enumerate the facilities which should be available in a properly staffed and organized rehabilitation department of a major hospital; he said that they also constituted the desiderata for an arthritis clinic. He drew attention to the fact that only a proportion of patients with rheumatism and arthritis were in need of the facilities of a rehabilitation department. The majority in all probability could be managed satisfactorily by private practitioners. Dr. Meyers then briefly discussed the term "rheumatism", and listed conditions other than rheumatic fever which were considered to be included in the terms "rheumatism" and "arthritis".

Discussing management, Dr. Meyers said that on a basis of types of functional capacity there were four categories

of patient, three of which presented problems in rehabilitation. The remaining category included patients whose management could be carried on satisfactorily by private practitioners. A thorough history and examination, any indicated tests and a diagnosis were necessary preliminaries. Then a careful appraisal had to be made of the relation of the patient to his environment, physical, mental, social and vocational—or to his *milieu extérieur*—and management directed accordingly. That entailed specific treatment of the disabling and coexisting conditions, physiotherapy, occupational therapy, assistance of the medical social worker when necessary, and assistance in finding suitable employment when possible, those measures all being undertaken under the control of the physician in charge of the patient. The physician should ideally have contact with the members of the patient's family, for their understanding and help might be of great value. Thus in the rehabilitation of the patient with rheumatism and arthritis, the functional capacities of the patient had to be considered against a background of his social and mental resources.

S. G. NELSON (New South Wales) said that he was in general agreement with the stress placed on the details of management. They included a diagnosis based on proper examination and investigation, adequate treatment of the disease, and then the consciousness of the need to return the patient to proper employment. Dr. Nelson agreed also that the large proportion of rheumatic patients did not present a problem in rehabilitation. Those patients who did need rehabilitation, especially the rheumatoid arthritic patients, presented difficult problems. They were rarely seen in the Commonwealth Rehabilitation Centres, because they did not qualify for the rather rigid standards of selection for that service. Because of the instability of the disease and the distribution of the lesions the patients might be regarded as in a state of dynamic balance or imbalance, the other forces acting being the interrelated ones of age, occupation, educational factors and morale. The doctor must be rehabilitation-conscious. There must be a suitable centre, and that should be at the hospital rather than one of the Commonwealth centres, for the reasons that he had mentioned previously. Finally, there must be availability of employment to persons so rehabilitated.

FRANK MAY (Victoria) said that Dr. Meyers had suggested that the term "physical medicine" should be dropped in favour of rehabilitation. Dr. Wedlick had mentioned some of the special problems which they as specialists in physical medicine were called upon to treat. Dr. May asked where, for example, prostatic diathermy, colonic irrigation and mild hyperpyrexia would be given except in places controlled by lay people for profit, often with quite unqualified personnel. Dr. May said that there was a tendency in other countries for the specialist in rehabilitation to lose sight of that side of physical medicine. Dr. May agreed with Dr. Meyers that the ideal would be for a department of physical medicine with rehabilitation to be in close association with the major hospitals, so that consultant specialist opinion was available. Some of the smaller rehabilitation centres were controlled by the ancillary medical services, with only occasional weekly or bi-weekly visits by the specialists in physical medicine and rehabilitation.

<sup>1</sup>The meeting held by the Section of Rehabilitation and Physical Medicine with the Section of Neurology and Psychiatry has already been recorded.

L. T. WEDLICK (Victoria) said that the term "physical medicine" should not be dropped. Physical medicine meant the use of physical measures in diagnosis and treatment. It was not concerned with rehabilitation alone. Electrical testing was used in the diagnosis of lower motor neuron lesions. In following up the progress in peripheral nerve lesions, and with the advent of intensity time curves, it enabled them to follow such progress accurately and to assist the surgeon in deciding when exploration was necessary. Zinc ionization was used in the treatment of hay fever and sinusitis. Ultra-violet rays were used locally for their bactericidal effects. Apart from the use of physical medicine in the treatment of rheumatic conditions and injuries, it had many other uses—for example, short-wave therapy in sinusitis and in pelvic infections.

L. J. A. PARR (New South Wales) said that apparently rehabilitation had been neglected in Australia and that a campaign was wanted to educate the medical fraternity, industry and the unions in what was possible at the present time. Industry should be coopted in order that, as in other countries, it could play its part in employing partially handicapped people. Unions should be taught that the handicapped people were employable and that their useful employment was necessary not only for the benefit bestowed on the disabled, but also from reasons of economy. A rehabilitation institute designed to receive patients from all hospitals, insurance companies and private doctors would be preferable to a multiplicity of rehabilitation centres attached to the big public hospitals.

GORDON RICH (New Zealand) supported Dr. May and Dr. Wedlick in their objection to changing the name of physical medicine. Dr. Rich briefly reviewed the position of rehabilitation in New Zealand and discussed the question of the rehabilitation of the tuberculous patient. He stressed the happy relations that existed between the council of the Federated Tuberculosis Associations in New Zealand and the various government departments of housing, social security and State advances, and with placement officers. Dr. Rich finally discussed the advisability of increasing the amount that ex-tuberculosis patients might earn without detriment to their pensions.

MOLLY HYNES (New South Wales) said that to run a rheumatology and arthritis clinic satisfactorily they needed an easily available transport service, ambulance or taxi as the case demanded, which was free of charge to the incapacitated persons who must attend hospital regularly for medical treatment and physiotherapy. Without that transport assistance they lost sight of many patients who were not well enough to surmount the difficulties of transport by themselves.

Dr. Meyers, in reply, said that in order not to be misunderstood in what he had said concerning the use of the term "physical medicine", he would restate his remarks, which were the following: "As far as rehabilitation is concerned . . . the term physical medicine has served its purpose and could now perhaps be discarded." Dr. Meyers said that he had the greatest admiration and respect for the work and comments of Dr. Wedlick, Dr. May and Dr. Rich, but his remarks concerned the use of the term "physical medicine" in regard to rehabilitation. Rehabilitation was a branch of medical practice in which relations with the community and with the latter's organizations should be very close, much closer than was the case in medical practice as usually carried out. Other speakers had pointed out that the term physical medicine was not readily definable and was not understood by many of the medical profession. On the other hand, the term "rehabilitation" was understood by the community. It was by no means implied that a rehabilitation department would no longer carry out electrodiagnosis; for instance, at King's College Hospital that work was often in the hands of a registrar, and indeed in a busy department it would be necessary for the physician in charge to delegate some of that work. Dr. Rich had referred to proper convalescent hospitals. Dr. Meyers said that they might arise merely from scarcity and cost of hospital beds. It was an erroneous assumption that a major hospital could not contain a sound department of rehabilitation. Thus two stories of

an addition to the University of Minnesota Teaching Hospital were to be devoted to rehabilitation, including in-patient accommodation. The latter was not of the usual type, but contained facilities for training the severely handicapped in the various aspects of community living, as well as in the activities of daily living. With regard to Dr. Parr's remarks, Dr. Meyers said that the disabled person must be trained so that he had a skill to sell. Complementarily, trades unions must be educated sympathetically to a realization of and acquiescence in the needs for permitting the adult physically handicapped person to undertake trade training in avenues which, despite vacancies, were at present closed. The need was again demonstrated for the employment officer to work under the immediate supervision of the physician in charge of the patient's rehabilitation—in other words, as an ancillary worker. Dr. Parr's remarks on wishing to see rheumatology divorced from physical medicine served to illustrate that practices differed in different areas. For instance, Dr. Tegner, of the London Hospital, not only combined rheumatology and physical medicine, but also conducted the school of physiotherapy. Dr. Meyers said that he agreed with what Dr. Nelson had said—that not many patients with arthritis were found in the Commonwealth Rehabilitation Service. In that regard, what Dr. Hynes had said had introduced two important matters. First, the medical social worker in a sound rehabilitation department was able to provide transport for patients needing it to ensure proper follow-up. Secondly, care must be exercised lest such domiciliary measures cut across private practice.

#### Ankylosing Spondylitis.

P. J. BENJAMIN (New South Wales) read a paper entitled "Ankylosing Spondylitis". He said that the condition had existed since earliest times, but had been recognized only since the beginning of the present century. It was an inflammatory rheumatic disease of unknown aetiology involving the spinal column in progressive ankylosis. The nomenclature was still confusing; American writers regarded it as rheumatoid arthritis, but most others recognized it as a separate entity. Sacro-iliac ankylosis was a constant feature, the symptoms were less severe in the female, and there was evidence that the condition could be inherited. Early diagnosis was desirable, but difficult; intermittent pain and stiffness were the first symptoms, while later there was spinal stiffness, with severe pain in the gluteal regions and the upper part of the thighs. Once the condition had fully developed, there were rigidity of the spine, a characteristic deformity with the neck craned forward, some dorsal kyphosis and slight flexion at the hips; there was pain on coughing or sneezing, or on sitting on a hard seat. Once suspected, diagnosis could be made by X-ray examination; in the initial stage there was blurring of the sacro-iliac joint space and some sclerosis. Later there were superficial erosion and patchy osteoporosis coexisting with areas of sclerosis, and finally bony overgrowth and ankylosis. Suspicion would be aroused by recurrent stiffness and backache in young people, and also tiredness associated with low backache and catching pains in the buttocks, recurrent alternating sciatica and thoracic girdle pains with restricted expansion.

After discussing the differential diagnosis, Dr. Benjamin said that there was no known cure for the disease, but that treatment, if started early, often arrested it. General health measures, physiotherapy, analgesic drugs, calcium gluconate, adrenaline, insulin, ACTH and cortisone had their place, but "Butazolidin" was of outstanding benefit and X-ray therapy was the treatment of choice.

S. G. NELSON (New South Wales) said that Dr. Benjamin had rightly stressed the importance of early diagnosis. Experience of specialists in rheumatic diseases relating to the manifestations at the earliest stage should be passed on to those practitioners throughout the Commonwealth who saw the patients first, the general practitioners. That meant that at the undergraduate and post-graduate levels teaching should stress those early symptoms and signs. The interpretation of the very slight radiographic changes

was very much a matter of judgement. That might account for the difference in figures of sex incidence referred to by Dr. Benjamin. The reduction of chest expansion might be an early sign and might assist in the diagnosis when X-ray changes in the sacro-iliac joints were indefinite. Experience of the radiographic appearances of the apophyseal joints, as an aid to early diagnosis, had been disappointing. Sometimes patients presenting with referred pain might have a neurological investigation. It was important to know that changes might occur in the cerebro-spinal fluid—for example, there might be raised protein and globulin contents. That might be part of the overall picture of ankylosing spondylitis and not of a spinal cord or *cauda equina* lesion. More patients would come under proper treatment by X-ray therapy if practitioners had a high index of therapeutic suspicion of the disease.

R. W. THOMPSON (New South Wales) emphasized the importance of early diagnosis before deformity, rigidity, or radicular symptoms appeared. Dr. Thompson said that Dr. Benjamin's plea for awareness of the disease had been borne out in an out-patient clinic for ankylosing spondylitis at Manchester. The early symptoms stressed were stiffness and low backache. An article had been published in the Press on those lines, and of 14 such patients seen at the one clinic, two said gratefully that they had attended because of the publicity.

B. L. DEANS (Victoria) referred to the importance of the various clinical patterns characteristic of the onset of the disease, and said that recognizable clinical features would in most cases precede demonstrable radiological changes. With reference to the latter, he said that it was important to be aware of the differing radiological appearance of the normal joint at different ages.

L. J. A. PARR (New South Wales) referred to the importance of the fact that there was a stage of varying duration in which there were clinical signs and symptoms of the disease but no radiological evidence. Dr. Parr said that the general practitioner must be made aware of the typical history of the disease, which included not only the clinical symptoms of lumbar and sacral backache, with the pain radiating to the knees in some instances, but also peripheral joint manifestations. Dr. Parr said that in their clinics they regarded intermittent hydrarthrosis of the knee joints as a common manifestation of ankylosing spondylitis, and they radiologically examined the sacro-iliac joints in all such cases. The evidence at present suggested that the disease in females was less severe than in males.

FRANK MAY (Victoria) said that ankylosing spondylitis was a disease of great interest. There were two schools of thought: one believed it to be a variant of rheumatoid arthritis, and the other thought it a separate disease. Kellgren spoke of it as a separate disease because of the sheep cell agglutination test. Dr. May said that if it was regarded as an infective process, he wondered why the process should in the majority of cases be distributed in the vertebral column. If one favoured the idea of Romanis, that in the male the infection was in the prostate and vesicles and in the female in the pelvic organs or possibly the colon, then the distribution might be decided by the paravertebral venous system. Injection with radio-opaque media into the dorsal vein of the penis and into the spinous process of a lumbar vertebra showed that there was a definite system of venous interchange between osseous and paravertebral tissues. The peripheral joints were involved in some cases, but after subsidence there was often no clinical or radiological evidence of the presence of the disease. Dr. May said that he knew of one case in which for years there had been a complete clinical picture of the disease, but no radiological evidence of ossification of the vertebral ligaments, though the sacro-iliac joints were involved in the earliest stage.

#### The Use of Mepacrine in Rheumatoid Arthritis.

L. J. A. PARR (New South Wales) discussed the use of mepacrine in rheumatoid arthritis. He said that there had

been some reports on the efficiency of the antimalarial drugs such as mepacrine and chloroquin in the treatment of disseminated *lupus erythematosus*. Dermatological manifestations had been a common indication of sensitivity to both sulphonamide and gold therapy in rheumatoid arthritis. A trial, first of mepacrine and later of chloroquin, had been made in rheumatoid arthritis by a number of authorities, and success had been claimed in approximately 50% of cases. Dr. Parr said that in his series of 14 cases, the purpose of mepacrine therapy had been mainly to find out whether there was any influence on old-standing as well as on severe rheumatoid disease. In consequence, in most cases recorded the disease had been present for a number of years. One patient had been followed up over a period of two years and nine months. Two fairly recent cases were presented to show the response in cases of short duration. The results of treatment proved that mepacrine had a definite anti-rheumatoid action in a large number of cases; even in those in which the disease was of long duration, relapse had occurred after administration of the drug was stopped.

J. A. SHANASY (Queensland) asked Dr. Parr two questions: (i) What other treatment was given concomitantly? (ii) What percentage of A grade improvement did he obtain over all? Dr. Shanasy went on to say that he had used mepacrine tentatively prior to the publication of Bach's paper, but after the paper had appeared he had become bolder and prescribed it freely. He had had two cases of severe dermatitis and three in which there was detectable pigmentation in the skin two years after the administration of the drug had ceased. Dr. Shanasy said that he had thought that the presence of L.E. cells in patients with rheumatoid arthritis would give a specific indication for the use of mepacrine. But Brunsting in 1953 had reported from the Mayo Clinic the presence of that phenomenon (L.E. cells) in such diverse conditions as rheumatoid arthritis, certain fatigue states in young women, thrombocytopenic purpura and others, and McCoy, Patterson and Freyberg had recently reported positive findings from the L.E. test in 25% of subjects of rheumatoid arthritis. Dr. Shanasy said that his own results had not been so spectacular with mepacrine, but a small number of patients showed remarkable improvement. One, a farmer, who had previously been just able to get about, was driving a tractor and erecting a fence five months later. Dr. Shanasy mentioned also that Bach, as a routine, now added "Butazolidin" to the mepacrine.

Dr. Parr, in reply to Dr. Shanasy, said that a number of rashes had occurred amongst his patients, and in one pigmentation of the skin on the lower limbs had been permanent. The rash generally disappeared in about four months. In one case, owing to a return of symptoms after the rash had disappeared, the administration of mepacrine was recommenced; after a period of eight months there had been no recurrence of the rash, and the disease was now in remission. With regard to the variety of rheumatoid arthritis which responded to therapy, Dr. Parr said that he had no decided opinion at present, but that he inclined to the view that patients with the vasospastic variety had been greatly helped.

In reply to a question asked by Dr. P. J. Benjamin, Dr. Parr said that he had no idea how mepacrine might act, but it had been suggested that adenosinetriphosphate was increased in amount by the drug.

In reply to a question asked by Dr. N. J. Davies, Dr. Parr said that he had had no evidence of liver injury due to mepacrine and that he did not employ any lipotropic substance to prevent injury. So far no signs of liver damage had occurred, but it must be observed that mepacrine and chloroquin had not been used when there was evidence of liver damage. In conclusion, Dr. Parr said that mepacrine and chloroquin seemed to offer a new tool in the treatment of rheumatoid arthritis, but that it was important to continue therapy for six to eight weeks before abandoning it if no satisfactory results had occurred. With regard to the skin-staining by mepacrine, a change could be made to chloroquin, but in Dr. Parr's limited



experience that drug had caused quite a lot of gastric disturbance.

#### Rehabilitation of Patients Suffering from Pulmonary Tuberculosis.

ERNEST SILBERSTERN (Queensland), discussing the rehabilitation of sufferers from pulmonary tuberculosis, said that it was in some respects materially different from the rehabilitation of patients who had lost a limb or the use of a limb, or were otherwise handicapped. Appropriate rehabilitation and reintegration of the tuberculous patient into a normal civil life and into the process of production was essential to prevent relapses of the disease for the individual and therefore also to prevent further spread of the disease within the community. Efficient rehabilitation and placement were essential, too, in order to gain the cooperation of the public for early diagnosis, admission to hospital and treatment by alleviating the fear of the patient for the economic future as well of himself as of his family. Rehabilitation should start spiritually immediately the news of the diagnosis was broken to the patient, and be carried out by theoretical literature and practical work, according to the condition of the patient, in the sanatorium under close and immediate supervision by the doctor treating the patient, up to the stage or almost the stage at which the patient could be discharged and gainfully employed, part-time or even full-time. The proper balance between rest and work—similar to diversional occupational therapy—had to be found and appropriately adjusted to the course of the disease and the treatment in the individual case. That could be done only by the doctor whilst the patient was an in-patient in the sanatorium, and the patient should be followed up afterwards by the doctor.

The hardest problems to overcome from the point of view of the patient were the rehabilitation and placement in appropriate jobs of the unskilled worker, of the worker aged over fifty years of age and of the aboriginal, and from the point of view of the public the prejudices of employer and fellow worker. Appropriate legislation was recommended to place rehabilitated persons in private enterprise, in semi-governmental bodies, in government agencies and in public service, as well as assistance in the case of part-time employment. Furthermore, Dr. Silberstern recommended proper education of the public, in order to make the rehabilitation and employment efficient for the patient as well as for the employer and for the community.

D. B. ROSENTHAL (Victoria) referred to the changing attitudes in the past ten to fifteen years, and said that he thought the degree of assistance now available, especially financial assistance, militated against successful rehabilitation. In his opinion the extra 10s. announced that morning for tuberculous patients, although an immediate financial gain, was so much more against rehabilitation. Dr. Rosenthal emphasized the place of incentive in successful rehabilitation; some people seized their opportunities whilst suffering from tuberculosis to improve their economic position. He quoted the case of an ex-policeman who became a successful manufacturer of leather goods. Dr. Rosenthal then briefly outlined the rehabilitation opportunities in Melbourne, and referred to work at "Stonnington", a hostel for ex-patients in training under assisted schemes. He thought that many patients did not want to be rehabilitated, and their attitudes made the work of those interested in the rehabilitation of tuberculosis patients less effective and less satisfying. Dr. Rosenthal finally said that whilst developments in the detection and treatment of tuberculosis were making rehabilitation requirements less urgent, a "hard case" of assistance would always remain, especially for one group mentioned by Dr. Silberstern—that of the middle-aged men without ambition or social responsibility.

S. G. NELSON (New South Wales) said that there were many points of similarity between the problems of rehabilitation relating to patients with arrested tuberculosis and rehabilitation problems in general. They included the need

for the wholehearted cooperation of the patient, the benefit to the individual, the problem of the prejudice against employment of the partially fit, and the difficulty in placing the patient in suitable employment. There were also certain points of difference; for example, in the early stage of rehabilitation there was the problem of balancing the effort in training against the possible harmful effect of the effort on the infective process. That needed supervision by a physician trained in the care of the tuberculous patient, as well as by an expert in rehabilitation techniques. At a later stage the prejudices of employers and fellow employees were aggravated by the fear of infection. That created a larger problem in public relations. Dr. Nelson said that he had been interested in the statement that salaried employment was safer than self-employment. Surely in certain conditions self-employment offered greater opportunities for regulation of rate of work, and in some cases might create a greater incentive by increasing the return in money to the individual. The concept of rehabilitation increasing the economic value of the individual, which Dr. Silberstern had mentioned, was not a common one in rehabilitation, in which one was usually content to get the patient back to work at a reduced economic level.

L. W. WING (New South Wales) put forward a plea that the medical attendant should provide a fuller report and direction as to the grade of work of which the patient with arrested tuberculosis was capable. Dr. Wing said that the industrial medical officer would arrange that and assure fellow workers that there was no danger.

Dr. Silberstern, in reply to Dr. McLean, said that work prognosis was too rigid a term, and had to be judged in every case on individual merit and reviewed from time to time, as a rule with the view of increasing it gradually.

In reply to Dr. Corr, Dr. Silberstern said that the previous remarks covered his points. They had almost every time failed to have ex-patients, even if clinically cured, reemployed by the public service despite all efforts and promises.

In reply to Dr. Wing, Dr. Silberstern said that they too had the same problems.

#### The Use of Cortisone and Allied Substances.

SELWYN NELSON (New South Wales) discussed the systemic use of cortisone and allied substances. He said that the use of cortisone in physiological doses in Addison's disease and for the substitution of extirpated adrenals contrasted with its use in various diseases in which doses far in excess of the normal were used to exploit various pharmacological effects of the hormone. Those effects included the anti-inflammatory action and the blocking of the antigen-antibody reaction.

In rheumatoid arthritis it was necessary to select patients for cortisone administration by reference to four groups of factors. The first related to the disease itself, which had to be in the active phase. Suitable patients showed a severe or rapidly deteriorating degree of joint involvement. They had shown unsatisfactory response to other forms of therapy, such as the administration of salicylates, "Butazolidin" and gold. The second group related to the patient. Working capacity, economic factors, age and sex influenced the decision. The occupation was considered in relation to the joint lesions. There had to be no disease such as pulmonary tuberculosis or peptic ulcer contraindicating the use of the hormone. Thirdly, in the absence of facilities for treatment in hospital a greater number of patients would be selected for cortisone therapy. The fourth group of factors concerned the favourable and unfavourable effects of the hormone. The likely gains from its use had to be balanced against the known dangers. Cortisone should be reserved for the severe, active form of the disease, in which other measures had failed to produce adequate relief, and for those whose working potential was endangered. A suggested dosage schedule was 200 milligrammes in four divided doses on the first day, 150 milligrammes on the second day, 125 milligrammes on the third day, and 100 milligrammes a day until the seventh

day, with progressive reduction to 75 milligrammes a day in the next fortnight. The dose might then be adjusted to the patient's particular requirements, by steps of 12.5 milligrammes. Administration should be continued until the disease was quiescent.

Dr. Nelson said that in the collagen diseases difficulties arose from complicating visceral lesions, but cortisone might be life-saving. In rheumatic fever its value was not established. It was useful for *status asthmaticus* and drug allergy as short-term therapy. Abrupt withdrawal was safe after short periods of use.

Other conditions in which cortisone was found useful included some cases of tuberculous meningitis to minimize the development of basal adhesions, sarcoidosis, ulcerative colitis, acquired haemolytic anaemia and the nephrotic phase of glomerulo-nephritis.

Newer developments of chemical synthesis might offer safer steroids with a better therapeutic ratio. Hydrocortisone and ACTH might be used instead of cortisone, generally with the same indications and occasionally with greater effect.

In conclusion, Dr. Nelson said that in considering cortisone and allied substances from the therapeutic aspect it was necessary to use them wisely and with restraint for the benefit of patients.

NAOMI WING (New South Wales) discussed the intra-articular injection of hydrocortisone. She said that for years patients with inflamed joints had sought some efficient method of local therapy for suppressing the local inflammatory reaction. In answer to their requests, a number of substances had been tried, but they had gradually been abandoned because they proved irritant to the synovial tissues. In 1951 Joseph Lee Hollander and his collaborators in Philadelphia began injecting hydrocortisone acetate into the joints of patients suffering from osteoarthritis, rheumatoid arthritis and gout. They also found the steroid beneficial in other structures with a synovial lining, such as tendons and bursae. During three and a half years up to October, 1954, they had given 17,000 intrasynovial injections to 1300 patients suffering from various forms of rheumatic disease. Numerous confirmatory reports in the world of medical literature had shown that that method had been widely accepted as an adjunct in the local management of arthritis and related conditions. The same workers had published a series of 171 cases in which beneficial results had been obtained from the new long-acting hydrocortisone with butyl acetate.

Dr. Wing went on to describe the pharmacology briefly and to enumerate the properties of hydrocortisone acetate. She detailed the indications and contraindications, and gave a description of the general technique of injection as well as that of the particular joints. She analysed a series of 663 injections which she had given to 145 patients, whose progress had been followed carefully over fifteen months, and said that in that series the techniques followed were those taught to her by Dr. Hollander in his clinic at the University of Pennsylvania. Six hundred and sixty-three injections had been given into 181 joints; 22 of the joints failed to respond to that method of treatment, a percentage failure of 11.05. There were few side effects, and only one patient who caused any anxiety whatever. Only patients with clear-cut indications were treated, and some patients who received benefit discontinued injections early because of the cost, which unfortunately was high. Dr. Wing said that if it was given early the treatment had been curative in joints with an acute effusion caused by trauma, and the patients had returned to work in days instead of in weeks as with other forms of treatment. Osteoarthritic joints had been relieved, but the injections had to be repeated at longer and longer intervals. The longer-acting higher esters were not yet available in Australia. In rheumatoid arthritis the treatment was very useful for suppression of inflammation of solitary joints which had not responded to a basic programme of therapy. In gout it was very useful for residual inflammation, such as that occurring in proximal interphalangeal joints, which had not responded to uricosuric agents.

Dr. Wing finally said that the method could be summed up as a practical addition to the therapy of rheumatic diseases if the indications and contraindications were kept rigidly in mind. The aseptic technique need not be that of an operating theatre; but the treatment should be regarded as a serious procedure and should not be performed unless a positive diagnosis had been established and the necessary requirements of sterilization of instruments, skin and hands were available. The joint approaches had all been carefully worked out to avoid arteries, veins and nerves. It was wise to spend time finding the exact spot before attempting to insert the needle. If all the instructions were followed, the results were very rewarding and the patients were most grateful for the good functional response which they obtained.

R. G. ROBINSON (New South Wales) said that his experiences with cortisone and hydrocortisone in rheumatic disease had been very disappointing. His first patient was a boy suffering from juvenile rheumatoid arthritis, whom he had been able to keep in a reasonable state with salicylates and physiotherapy. In 1950 the boy's relatives secured cortisone, which Dr. Robinson was only too keen to try. The effect was as dramatic as was the pitiable decline when the meagre stocks ran out. Eventually the boy died—far more quickly, in Dr. Robinson's opinion, than if he had not had the few months of cortisone therapy. Dr. Robinson said that subsequently, as more experience had taught them the limitations of the hormones, the catastrophes, the dosage and the indications, results had been better. However, cortisone used alone had for him produced only one definite complete long-term remission. He now regarded it only as a useful adjuvant during certain stages. Examination of the scientific statistical papers on that subject would reveal that in chronically active rheumatoid arthritis not more than 20% of patients could tolerate the steroids for more than two years. The side effects were well known and had been mentioned. When dosage was reduced to a level at which they did not occur the drug was no more effective than aspirin. That had been borne out by the report of the joint committee of the Medical Research Council and the Nuffield Foundation, which indicated that when the value of cortisone and aspirin in the treatment of early rheumatoid arthritis was compared, aspirin was as effective as cortisone in maintaining functional level and in suppressing activity of the disease process. Dr. Robinson further said that the escape phenomenon of late hypercortisonism with all its signs of toxæmia was a very real problem. It must be a manifestation of the fact that a self-perpetuating antigen had continued to build up its forces behind the cortisone barrier until it overflowed that artificial protection. Nor was the picture any brighter when they turned to the new more potent derivatives recently marketed. "Meticorten" had its own particular disadvantages. It was true that in moderate dosage salt retention did not occur to any degree; however, psychiatric disturbances, ulcer and hæmorrhage had occurred. Hæmatocrit readings did not improve to any extent, which indicated continued bone-marrow toxæmia, and the erythrocyte sedimentation rate, which was initially lowered, rose at a later stage, which indicated maintained activity. Dr. Robinson said that apparently they might look forward to a new escape phenomenon akin to late hypercortisonism. More worrying was the sharp rise in serum cholesterol content which was seen, and a case had been reported in which an induced Addisonian crisis had occurred on a dosage of 30 milligrammes of "Meticorten" per day. Obviously the drug had suppressed the total function without substituting fully for that suppression. Dr. Robinson said that they must learn to use those drugs with a proper regard for their power, and as the asbestos suit, not the fire fighter. He put forward a plea that while they should use those drugs with intelligence and discrimination, they should never lose sight of the ultimate goal, which was the discovery of the ætiological factors and their treatment, and not just the temporary partial amelioration of the effects.

Referring to Dr. Wing's remarks, Dr. Robinson pointed out that low-grade infective arthritis might develop, and

he adopted the practice of giving small cover doses of antibiotics or sulphonamide drugs to prevent that main danger of injecting hydrocortisone—it might cause the condition to flare up.

MICHAEL KELLY (Victoria) referred to Dr. Nelson's statement that peptic ulceration might develop quietly. Dr. Kelly quoted one case to illustrate that occurrence, and also the case of a patient who had taken cortisone for two years since a gastrectomy without any further gastric symptoms. Dr. Kelly said that he did not like to start with a higher dosage than 100 milligrammes daily. Commencing doses as high as 200 milligrammes daily were likely to give rise to relapses when the dose was reduced to 150 milligrammes daily. Dr. Paul Holbrook had recently distinguished between analgesic doses (100 milligrammes or less per day) and suppressive doses (200 milligrammes per day), and his statistics showed that the results were better with the lower dosage. Dr. Kelly said that recent reports of deaths occurring during cortisone treatment were very disturbing. Four deaths had occurred among 106 dermatological patients. That had been reported by the Medical Research Council, and had made him wonder whether the drugs should be used at all. No surgeon would recommend an operation on patients who were not very ill if it had a mortality rate of 4%. Dr. Kelly went on to say that he agreed with Dr. Wing about the difficulty of making an injection into the hip joint. He referred to the work of Dr. Marjorie Dobson, who had proved radiologically on cadavers that 40% of attempts to inject the hip joint were failures.

J. A. SHANASY (Queensland) said that he did not prescribe cortisone unless it was necessary to control some condition producing great deterioration. However, three patients who were provided with supplies of "Metacortandrin" by American relatives had experienced good remissions on a low daily dose of five to ten milligrammes, so far without ill effects. Dr. Shanasy referred to hydrocortisone; he said that it was well known to stimulate the growth of bacteria, and contamination infection associated with hydrocortisone was rapid and acute. Many such cases had occurred in the United States of America. That was important from a litigation angle, and Dr. Shanasy urged all users of that hormone to have all syringes and needles properly autoclaved and to attend carefully to skin preparation. Dr. Shanasy said that he had used that injection in many joints, but mainly in hips and knees, in some cases repeating the injection when the pain returned, in others giving an injection once a week for six weeks. That latter method had rendered patients suffering from osteoarthritis of both knees free from pain and swelling for nine months. The antero-lateral oblique approach to the hip joint with adequate X-ray localization was a simple procedure. Over eighteen months he had been unable to detect any alteration in the X-ray appearance of joints treated with hydrocortisone. Jersan and Brown, of Philadelphia, had recently stressed the importance of early and repeated injections to prevent deformity and assist in rehabilitation of the patient with an arthritic hand. Dr. Shanasy said that Dr. Wing had already travelled far along that road.

Dr. Nelson, in reply to Dr. Robinson, said that he agreed that it was essential to stress the need for caution in the use of cortisone, a potentially dangerous substance. The aspirin-cortisone trial was carried out in early cases, many of which would not qualify for the rigid criteria laid down in his paper. It was in the savagely active cases that cortisone was helpful to prevent crippling. Disseminated lupus erythematosus was a disease entity, as was rheumatoid arthritis. The so-called mutation cases had been disseminated lupus erythematosus from the beginning, misdiagnosed as rheumatoid arthritis.

Dr. Nelson then said that "Metacortandrin" was still in the experimental stage, and its long-term effects were unknown.

To Dr. Kelly, Dr. Nelson said that the silence of the peptic ulceration was well known. After gastrectomy many of the factors causing peptic ulceration were removed. The

aggravating effect of cortisone was less likely to produce ulceration after gastrectomy. Cortisone was a dangerous substance, and a careful watch on its potential lethal effects was necessary, as in surgical procedures. Dr. Nelson said that he had used the high initial dosage technique in preference to the low initial dosage technique, although he knew that many writers preferred the latter. The initial effects were much more dramatic.

In reply to Dr. Shanasy, Dr. Nelson said that he preferred a long course to multiple short courses. Relatives of doctors and of Americans were bringing pressure to bear on the doctor to use cortisone against his better judgement—almost another indication.

To Dr. Hynes, Dr. Nelson said that the criteria mentioned in the paper were similar to those of Copeman, Mason and Savage.

In reply to Dr. Parr, Dr. Nelson said that mental trouble was a problem which occurred. Often insomnia not relieved by simple hypnotics was an early indication of likely trouble. Osteoporosis might be due to loss of protein, and therefore was not likely to be alleviated by calcium given either by mouth or parenterally. The dose for children was usually similar to that for adults.

#### Ultrasonic Therapy.

LEIGH WEDLICK (Victoria) discussed ultrasonic therapy. He said that extravagant claims made for ultrasonic therapy had made it essential for practitioners to be critical in their appraisal of results. In order to use the treatment intelligently, it was necessary to have a clear understanding of its mode of action and of its effect on the body. Ultrasonic energy was sound with a frequency higher than the upper audible limit, the usual frequency being 800,000 cycles per second. An alternating electric field applied to a crystal caused mechanical deformation, and that vibration was transferred to a thin metal plate forming the sound head. There were important differences between audible sound and ultrasonic energy. Ultrasonic energy was propagated in the form of a localized beam, and local effects were therefore confined to that beam. Furthermore, ultrasonic energy was absorbed by a thin film of air, though it passed readily through water or oil. Therefore, in order to transmit the energy to the body, it was essential to exclude any intervening air space by using a coupling medium—usually water or paraffin oil.

Dr. Wedlick went on to say that the effects on the body had not yet been completely worked out; but in therapeutic dosage the main effects appeared to be three in number: (i) A powerful micromassage or shaking of the tissues. (ii) Heat production concentrated mainly at tissue interfaces; that unusual heat distribution might account for the differences between ultrasonic and other forms of heat treatment. (iii) Increased permeability of the tissues. Penetration was limited; at a depth of four inches only 12.5% of the incident skin energy remained. The moving head technique was the safest, paraffin oil being used as the coupling medium; but subaqueous application was used in treating raw surfaces or when it was difficult to maintain good apposition with the skin. The use of the stationary head technique was best left in experienced hands. The treatment time varied from three to twelve minutes, and the dosage from 0.5 to 3.0 watts per square centimetre of the sound head. Small frequent treatments were given in acute cases; larger, less frequent applications in chronic cases. Treatment was contraindicated over the eye, growing bone ends, the heart, the gravid uterus and the sex glands.

Dr. Wedlick, in conclusion, said that it would appear logical on theoretical grounds that the main use of ultrasonics lay in the promotion of local inflammatory reactions, particularly in the treatment of scars and superficial lesions in soft tissues. His own practical experience seemed to conform with that, although he had been a little disappointed with the erratic response to treatment in different cases. It seemed that ultrasonics had a place, but a limited place, in physical therapy as a whole.



T. W. BURGESS (New South Wales) read a paper on the application of ultrasonic therapy. He said that a coupling substance was necessary to transmit the waves to the body; a coating of liquid paraffin could be used, the part could be immersed in water, or a rubber cushion filled with water could be interposed under the sounding head. Dosage was measured in watts per square centimetre of skin. The sounding head had to be kept moving evenly over the area to prevent over-stimulation. The therapy was most effective in degenerative bone diseases, osteoarthritis and fibrositis, and for softening scars and fibrous tissues.

GORDON RICH (New Zealand) said that ultrasonic therapy should be approached from a conservative point of view. Low intensities and short exposures gave the best results in his hands. Patients suffering from periarticular arthritis and cervical arthrosis did well with ultrasonic therapy combined with manipulation in the latter case. Dr. Rich instanced patients suffering from disk lesions with loss of ankle jerks who had been completely relieved by six weeks' treatment, with a return of the ankle jerk. Other patients suffering from pain in the leg were found to have referred pain from disk lesions in the lumbar area. They had also responded satisfactorily to treatment.

J. A. SHANASY (Queensland) said that ultrasonic therapy had recently been hailed as a cure-all in the American lay Press. He hoped that that error would not be perpetuated in Australia. Dr. Shanasy said that he had been using ultrasonics for over four years, and whilst he had had spectacular results in some cases, in others in which the clinical condition was similar no improvement had been obtained. In the German literature it was admitted that that occurred, but no explanation was given. Dr. Shanasy said that the method was a valuable addition to physical medicine, and he found that on the practical side he had obtained optimal effects by discarding the three watt per square centimetre technique and using the 0.8 to 1.2 watts technique. He had found it very important to use an extremely slow movement of the treatment head—one that was just within tolerance.

R. G. ROBINSON (New South Wales) said that it had been indicated that ultrasonic therapy was of value in Sudek's atrophy. Presumably it would be effective in other neurovascular dystrophies associated with spondylitis and other irritative conditions. In cases of dystrophic rheumatoid-like arthritis, shoulder-hand syndrome and Sudek's atrophy Dr. Robinson wondered whether the treatment should be applied locally or over the neck, or to the sympathetic system or the precipitating focus or both.

Dr. Wedlick, in reply to Dr. May, said that in his experience ultrasonic therapy had been valuable in the treatment of painful amputation stumps. In reply to Dr. Rich, Dr. Wedlick said that he agreed that ultrasonics should be treated with caution. With regard to the results in periartthritis of the shoulder, Dr. Wedlick said that in a recent publication by Krusen it had been found that ultrasonics had no advantage over microwave therapy when either was used in combination with massage and exercises. Dr. Wedlick said that he did not like the term "supersonics"; it was ambiguous and best confined to aeronautical use. The term "ultrasonics" was preferable. In reply to Dr. Shanasy, Dr. Wedlick said that he had no explanation of erratic results; he also obtained erratic results. He thought that there might be some explanation in the technique used. In his experience ultrasonic therapy was a method better kept in reserve rather than used as a routine procedure. In reply to Dr. Robinson, Dr. Wedlick said that in the shoulder-hand syndrome and in Sudek's atrophy he thought that early physical therapy was the secret, whether ultrasonic or otherwise.

#### Manipulation of the Spine.

NORMAN LITTLE (New South Wales) discussed manipulation of the spine. He said that although he proposed to give a demonstration of the methods used when a spine was being manipulated, a few introductory remarks were necessary. He stressed the importance of movement to the human body and showed that the spine was particularly

liable to have its movements interfered with because of the peculiar arrangement of its joints, which could become subluxated, locked or chronically strained.

Dr. Little then dealt with the indications for manipulation of the spine under the headings of trauma, disk lesions, acute lumbago, *spondylitis osteoarthritis*, adhesions, referred pains, psychological backache, and diagnostic procedure. He said that before the actual methods used were described, certain precautions would need to be stated. A complete examination of the spine and adjoining joints was essential. Caution was necessary in relation to spines with limitation of movement in all directions, while extra caution should be taken when a patient complained of backache which was relieved only by morphine, even when there were no significant X-ray changes.

Dr. Little went on to describe the actual manipulations used for the three areas of the spine—cervical, dorsal and lumbar. He said that in the cervical area distraction along with rotation was the first movement; then lateral flexion, with the head in increasing degrees of rotation so as to transmit movement to each segment of the cervical part of the spine, was carried out on both sides. In the dorsal area the main manipulation was a forward thrust of moderate force through a small range; each segment was dealt with separately—firstly, in the mid-line, and then each side of it. After that, rotation was carried out by forcing the shoulder and hip of the same side in opposite directions. The lumbar area and sacro-iliac joints were manipulated together. The lumbar part of the spine was gently flexed, then rotation was performed, with the patient on the side, by forcing the shoulder and hip of the same side in opposite directions. That manoeuvre was repeated on both sides, when the dorsal and lumbar parts of the spine were being manipulated. Next, with the patient supine, one lower limb was flexed on to the trunk and suddenly extended to produce distraction; that was repeated on the opposite side, and was followed by further distraction with an assistant applying the countertraction by placing his hands in the axilla.

FRANK MAY (Victoria) said that Dr. Little had been fortunate enough to have the opportunity of seeing the work of the late Sir Herbert Barker. Later, becoming an orthopaedic surgeon had given him the proper background to become an expert on the subject; many who claimed to be experts had not that quality.

Dr. May went on to say that manipulation was not new; it had been practised for centuries, but—as in many other examples in medical history—a long time had been taken to win over medical thought. The recent knowledge of the pathology of the intervertebral disk had added much to the appreciation of problems of the disorders of the vertebral column, but only sporadically did the subject of manipulation come forth. It was advised by some and condemned by others. Probably James Mennell, by his teaching over the last twenty-five or thirty years, had done more than anyone to attempt to interest the medical profession in the science and art of manipulation. Many lucrative practices had arisen from the practice of manipulation by unqualified and unorthodox practitioners. The whole cult of osteopathy, started by Andrew Still about seventy-five years earlier, was world-wide, and there were few medical men who would accept the osteopaths' pathology. On the other hand, there were some schools of osteopathy which now had a comparable medical training; that was perhaps evidence of an admission of what was lacking. The theory and practice of chiropraxy, introduced by Palmer about fifty years earlier, had less to recommend them. It was undoubted that in practice many good results had been obtained, otherwise both cults would long since have died out.

Dr. May then said that for the last twenty-one years he had many times been glad, and his patients gratified, that a quick, easy cure was obtained. No other way of getting those results could be imagined, except in the few instances in which he had known people to fall or stumble, something went "click" and they were cured.

The pathology of the intervertebral disk had been accepted by the medical profession as something giving them a considerable understanding of many spinal conditions, and the lay and unqualified had only too readily changed over from the "muscle out of place" (a ridiculous conception) or the "small bone out of place" to that of the "slipped disk". Though that was an important factor in the causation of lumbar pain and sciatica, it was not the only factor. Dr. May referred particularly to that of joint fixation. They accepted that joint fixation elsewhere in the body was the cause of pain and needed mobilization, and he saw no objection to that concept in relation to any of the many joints of the spine—the intervertebral and the apophyseal, particularly the latter.

Any rupture or displacement of an intervertebral disk producing pain severe enough forced immobilization, or immobilization was obtained by such conservative means as rest in bed, by braces or by a plaster jacket. If any joint was immobilized for long enough it became stiff, and in many cases adhesions developed. Usually they were gradually stretched out by exercises, but they could be much more quickly and easily stretched out by carefully controlled manipulation or spinal adjustment—really a mobilization. In many cases sciatica, after the acute stage had passed, became static for a long time, and much unnecessary physiotherapy was given for the relief of symptoms. Two or three manipulations with exercises soon produced a happy result.

Dr. May said that at no stage did he believe that all those fancy methods and machinery of spinal traction did anything in the way of replacing a prolapsed nucleus or disk. They might help to mobilize the joints. Traction was essential for the cervical part of the spine; but he doubted whether there was any real method of traction of the lumbar part of the spine which really separated intervertebral joints as in the cervical part of the spine. In the treatment of the lumbar part of the spine he found rotation the most important manipulation. It was mostly one of the involuntary movements, and therefore had to be done for the patient and not by the patient. There was an art in doing that, and it was not always necessary to give a general anaesthetic. It was only when the patient was a big, strong, stiff person that that might be necessary, or when the pain was too much for the patient's threshold. Dr. May said he was sure that damage could be done by a powerful manipulation whilst the patient was unconscious, especially if spinal flexion was performed.

The result obtained by manipulation of the cervical part of the spine was equally, if not more, satisfying. So many patients presented with headaches, neck aches and arm pain, and the results of manipulation were so universally good, that he was sure those present had all been interested to hear Dr. Little's remarks on the subjects. Those patients were perhaps more easily treated because of the undoubted ability to stretch the neck with a pull of 60 to 70 pounds. That had been verified by X-ray examination.

Dr. May said that the investigation of those patients by X-ray examination always needed oblique films to show the extent of narrowing of the foramina. Although according to anatomists the nerve occupied only one-fifth of the foramen, he was sure that perineural and neural oedema was one factor, but dural and arachnoid adhesions were probably important. Apophyseal joint osteoarthritis with joint fixation or periarticular swelling was certainly another cause of pain, stiffness and limitation of movement. Sir Russell Brain had indicated the pathology of the intervertebral foramina with arachnoid and dural adhesions. The apophyseal joints, which were in the posterior wall of the foramina, were subject to considerable osteoarthritic processes, and although that might possibly, or conceivably, cause some pressure on nerve roots, it was more likely that adhesions, as mentioned before, were the prime factor. Also, an osteoarthritic joint was usually a stiff joint causing a limitation of the normal voluntary movements of the neck and also of the involuntary movements. It was by freeing those joints that most of the good results were obtained.

Dr. May then gave a warning against being too vigorous when the patient was under the anaesthetic. He said that acute flexion of the neck could possibly cause nuclear and intervertebral disk propulsion on to the spinal cord. A simple cause of pain was just a tightness and a spasm of muscles perhaps causing some headache, which again was relieved by a simple manipulation. Finally, there were many cases of dorsal pain, dorsal discomfort and intercostal neuralgia and root pains, all of which were real entities. They were often associated with wedging of vertebra, with lipping of the bodies and, in some cases, with spondyloarthritis and narrowing of the disks. In that connexion again Dr. May had no hesitation in performing rotation and extension manipulation, a method from which he had had many spectacular results over the years. He was sure that in some cases the condition was due to fixation of costo-vertebral joints following sprains or as the result of osteoarthritis.

Patients with *spondylitis ankylosa* and general osteoarthritis should not be treated by manipulation. Dr. Little did not mention coxalgia. Patients suffering from that condition should always be treated by manipulation before surgery was considered.

Dr. May finally said that it was to be hoped that a greater interest would be taken in the subject; but a warning must be given that it was an art to be learned, and not just brute force. They should not close their eyes and think that manipulation was all humbug, but remember that patients were frequently relieved and often cured of their disability by its use.

L. T. WEDLICK (Victoria) said that in *spondylitis osteoarthritis* manipulation was valuable, especially when the area affected was the cervical or dorsal section, and it might be of value even in cases in which pronounced X-ray changes were present. It could often be carried out without general anaesthesia, but in cases in which spasm was pronounced it was wise to be cautious. Persistent pain relieved only by morphine in patients past middle age should certainly arouse suspicion of secondary malignant disease, even if the X-ray findings were negative. The findings might not become positive for some time. Referring to subluxation, Dr. Wedlick asked why a medial meniscus had to be out or in, and whether it could not just be nipped. He said that any limitation of extension at the knee joint should arouse suspicion of that and warrant a consideration of manipulation. The results were often dramatic. Dr. Wedlick then asked whether Dr. Little saw many patients suffering from tennis elbow suitable for manipulation. He said that he himself saw a few only with limitation of movement, in whose treatment manipulation gave dramatic results. In cervical disk lesions they obtained benefit from traction, but too early rotation might aggravate the symptoms.

R. G. ROBINSON (New South Wales) said that there appeared to be two types of end results in disk degeneration. The first group was that in which there was simple subsidence of one vertebral body upon the second. In the other group, in the absence of focal herniation of the nucleus pulposus, the patient developed scoliosis, rotation and eventual spondylosis, a permanent disability. That might be, but was not always, caused by an angulated position of the apophyseal facets. Dr. Robinson asked whether manipulation could be of benefit in correcting the scoliosis and rotation.

Dr. Little, in reply to Dr. May, said that he did use traction of the neck in cases of marked limitation of movements, when manipulation failed to give relief. A manipulation for the upper dorsal part of the spine was a combination of that used for the cervical and dorsal areas. He had never used manipulation for a coccydynia.

In reply to other questions, Dr. Little said that he thought it safer to use an anaesthetic in most cases, when undertaking manipulations. He had known symptoms to be aggravated at times, but had not seen any serious damage done; it was essential to avoid acute flexion and

hyperextension in all cases. The noise heard during manipulation was probably due to a parting of adhesions. There was no reason why a so-called acute strain of the lumbar region should not be manipulated provided there were no contraindications on X-ray examination. Dr. Little said he did believe that there was such a thing as subluxation of the sacro-iliac joint, but it was extremely rare; the manipulation was almost the same as that for the lumbar region. Residual scoliosis after manipulation could be due to many factors; probably the commonest was incomplete relief with consequent muscle spasm. Structural scoliosis had to be ruled out and the lower limbs measured.

The methods used by him in manipulating were those found to have been the best over the years. A firm couch at most 22 inches high was better than the floor or a bed; it was impossible to get sufficient purchase with the latter. He agreed that it was better to diagnose the lesion, if possible, before resorting to manipulation, but in some cases it was done empirically with complete relief to the patient. He believed that pieces of disk tissue did slip, even inside an apparently intact *annulus fibrosus*.

By request, Dr. Little repeated the manipulations on a model.

## Section of Surgery.<sup>1</sup>

*President:* A. H. Lendon, M.B., B.S., F.R.C.S., F.R.A.C.S., South Australia.

*Vice-Presidents:* A. C. Thomas, M.B., Ch.M., F.R.C.S.E., F.R.A.C.S., New South Wales; F. K. S. Hirschfeld, M.A. (Oxon.), F.R.C.S., L.R.C.P., F.R.A.C.S., Queensland; B. W. Nairn, M.B., B.S., F.R.C.S., F.R.A.C.S., Western Australia; L. H. Ball, M.B., B.S., F.R.C.S., F.R.A.C.S., Victoria; J. B. G. Muir, M.R.C.S., L.R.C.P., M.B., M.S., F.R.C.S., F.R.A.C.S., F.A.C.S., Tasmania.

*Honorary Secretary:* Dr. A. C. R. Sharp.

### President's Address.

A. H. LENDON (South Australia) presented his president's address under the title "The Teaching of Surgery". Dr. Lendon said that in teaching surgery to undergraduates the aim was to enable them to recognize the common surgical conditions, to treat the minor conditions adequately and to perform the common emergency operations. Although the tendency was to reduce systematic lectures, Dr. Lendon did not consider that to be a good thing. Clinical lectures and demonstrations were of no value to large classes. Teaching in the wards was one of the most important parts of training in surgery, together with teaching in the surgical out-patient department and casualty department. Training in the operating theatre was less important, especially if it involved cluttering up the theatre with numbers of students. Tutorial instruction was perhaps the most important part of all training. As regards teachers, Dr. Anderson was of the opinion that a part-time director of surgery was likely to give better teaching than a full-time professor.

The year's internship as a prerequisite to registration was essential. In the post-graduate field there were the general practitioners who wished to improve their surgery, and provided a difficult problem in organization, and those graduates who wished to specialize in some branch of surgery, and were prepared to give the necessary time to securing higher qualifications. Each had to be provided for according to his particular needs.

SIR HAROLD DEW (New South Wales) said that in Australia the United States and British methods could not be followed closely. It was necessary to compromise and make local adjustments. The student must largely teach himself. He must learn how to learn and go on learning. Sir Harold Dew was certain that students did well in that. He did not agree that the medical schools trained general practitioners. They gave them a medical education on which they could go anywhere. The training of the first three years must not be sacrificed. Sir Harold Dew agreed that set lectures should be kept down to a minimum. He thought that bedside training by a great variety of people was important. Despite all the problems, he thought that

the average product going out was "pretty good". He agreed that it was a waste of time for many students to be in operating theatres, except for the one student whose case it was. In the final year, students should largely be left to themselves. The post-graduate young surgeon must go back to the basic sciences. Anatomy was usually weak. A man should obtain his "primary" before being taken on seriously by any surgical team for his training.

KONRAD HIRSCHFELD (Queensland) said that he had for many years been interested in the teaching of undergraduates. He thought it should be remembered that hospitals were part of a university, and therefore that the duties of teachers were not only to teach the students to accumulate facts, but also to teach them to think. He believed that the students were getting their medical facts very well, but he thought that the process of teaching them to think was lagging behind. Processes of thought could be taught only by example. Unless students would exhibit their thoughts, nothing could be done to help them. They were, however, reluctant to give their opinions. Dr. Hirschfeld said that he had recently conducted an inquiry amongst his students as to why they were hesitant to give opinions and to speak up in class. They all seemed to be a little hurt by his somewhat forceful approach to teaching, but nevertheless they were well aware of the causes of their failure to take an active part in the discussion of a case. The causes were two. The first was reluctance to give an opinion for fear it was wrong, and therefore their fellows and the teacher might think less of them. The second was a secret desire to remain inconspicuous. Dr. Hirschfeld said that surely it was the duty of teachers to teach students to overcome both those faults, for the friendly atmosphere of a hospital was the best place to learn to state an opinion, even if wrong, and forget embarrassment at appearing conspicuous. If students did not learn those things as students, they might be forced to learn them in a most unfriendly manner in a court of law. It was the job of teachers, therefore, to teach them, even if the teacher had to be rude. Dr. Hirschfeld said he found that the modern method of very friendly instruction did not teach the lesson, for the students seemed to be a little confused between what was being taught and what was affability of the teacher. Students on the whole seemed to regard themselves as very ill-used, and he had no doubt at all that the constant discussion of the faults of the curriculum and the deficiencies of examiners fostered their attitude. They had come to believe that they must be

<sup>1</sup>The meetings held by the Section of Surgery with the Section of Medicine and Experimental Medicine, the Section of Paediatrics, the Section of Pathology, Bacteriology, Biochemistry and Forensic Medicine, and the Section of Orthopaedics have already been recorded.



taught, forgetting that there were two processes, one of learning and one of teaching, and they had to do the learning, but it seemed that they thought the teacher's job was to "learn them". The proper relation of student and teacher had been most beautifully put by Dr. R. G. Latham over 100 years earlier, when, as he led his students into the wards of St. Bartholomew's Hospital for the first time, he used the following words: "You are about to enter this hospital, this great place, where you will see many a strange and many a wondrous thing, and I will go with you and be your guide. But it is with your own hands and your own eyes and your own minds (and I might add your own hearts) that you will see and learn and profit. I can do little else than go with you and say see here, and see there."

V. M. COPPLESON (New South Wales) said that he thought the thesis that an undergraduate course should be sufficient to produce general practitioners was fallacious and dangerous. During the undergraduate course, it was not possible to teach students much more than the ABC of surgery, and the surgical paths of graduates whose surgical education was limited to their undergraduate experience were likely to be watered by the tears of the widowed, the orphaned and the maimed. Post-graduate training was essential, and the one year's hospital training for graduates before registration was imperative, minimal and, for surgical training, insufficient.

Dr. Coppleson went on to say that the problems of surgical training in Australia had placed the post-graduate organizations in a dilemma. The Post-Graduate Committee in Medicine in the University of Sydney at first took the stand that it would insist on the highest standards, that all those desiring surgical training should complete a full and lengthy course of training, and that it would not hold courses at lower standards. Lately, however, it had given approval and support to special residency training for general practitioners in which suitable surgical experience formed a part. Whilst that appeared at the moment to be the best method of meeting the special needs of certain parts of Australia, where great distances and isolation required a number of general practitioners to be equipped to deal with many surgical problems, it had inherent in it the danger that surgery at that level would become widespread and would lower the general standard of surgery in the community. That now appeared to be taking place, and a large proportion of the surgery of New South Wales and Australia was being carried out at present by untrained or partly trained surgeons. One obvious contribution to a solution of the problem was to increase the number of properly trained surgeons and the facilities for training them. With that end in view, the Post-Graduate Committee in Medicine in the University of Sydney was engaged in an attempt to increase the number of training appointments and to raise them to standards which would compare favourably with similar posts overseas.

N. G. SUTTON (Queensland) agreed that students should be trained not as general practitioners, but in general medicine, so that they might choose whatever course they liked. He was of the opinion that lectures were most important. The scientific outlook of the first three years was thus continued. Professor Sutton agreed with the tutorial teaching referred to by Dr. Lendon. He agreed that out-patient treatment was difficult to arrange, but important. He also agreed that clinical lectures were no longer of much value.

H. C. BARRY (New South Wales) said that the teaching of surgery in Australia contrasted in three points with British teaching. The first was teaching in the out-patient department by senior staff, which was most valuable. The second was the surgical registrar teaching in England, which also was most valuable. The third was discipline, which came from both sides, and an evidence of that was punctuality of honorary surgeons, *et cetera*.

Dr. Lendon, in reply, said that Sir Harold Dew and Dr. Coppleson had apparently thought he meant that the training of the general practitioner was complete. He did not mean that, but, in view of the vastness of Australia, graduates must know how to deal with common surgical

emergencies. Dr. Lendon agreed thoroughly that the post-graduate student should have his "primary" before being accepted for training. Dr. Lendon also agreed that there was nothing worse than the affable teacher who called the students by their Christian names.

#### Lumps in the Breast.

A. C. THOMAS (New South Wales) presented a paper on "Lumps in the Breast". He said that the thesis of his paper had been to show that, notwithstanding clinical experience and aids to diagnosis, there was only one way of diagnosing a "lump in the breast" with certainty, and that was by biopsy. Of 150 patients suffering from tumours of the breast, 83 were proved to have carcinoma. Of those, 13 were admitted to hospital with a provisional diagnosis of a simple condition. On the other hand, of the 67 non-malignant conditions the pre-operative diagnosis in 14 was carcinoma, and four of the patients had had radical mastectomy performed. It was admittedly a small series, but the numbers were significant.

Dr. Thomas stressed the importance of a full and complete history and examination in the consideration of all lumps in the breast, as in all branches of medicine. He said that while the assistance of transillumination, X rays and needle biopsy was recognized, the only sure method was surgical biopsy. He went on to say that the condition known as fibroadenosis, cystic hyperplasia, hormonal mastopathy and various other names was the commonest disease of the breast which brought the patient for advice. He discussed its various types and their relationship to cancer of the breast, and said that while it could not be proved that it was a precancerous condition, it was common to find the two coexistent. A discharge from the nipple, whatever its character, demanded serious attention, and the segment involved should always be excised. Cancer of the breast, when it could be definitely diagnosed, was always somewhat advanced. The history of a lump in the breast accidentally noticed should always be regarded seriously. It might occur at any age.

Dr. Thomas discussed the relation between trauma and cancer and the importance of distinguishing cancer from traumatic fat necrosis and plasma cell mastitis. He did not find convincing the view that there was a definite relationship between trauma and cancer. He said that simple tumours of the breast, which were usually fibroadenomata, were easily diagnosed. They sometimes assumed very large proportions and presented as Brodie's serocystic disease, *cystosarcoma phyllodes*, *et cetera*, and might undergo subsequent malignant change. Other lesions of the breast, such as sarcoma and the granulomas—tuberculosis, actinomycosis, syphilis—as well as chronic inflammatory conditions, must always be considered in the diagnosis of breast tumours. Metastatic nodules in the breast were rare, but did occur—for example, melanomata.

In conclusion, Dr. Thomas said that all lumps in the breast demanded excision and histological examination for their true diagnosis, and that could not be stressed too strongly.

H. R. G. POATE (New South Wales) said that often multiple lumps were present in the breast affected by cystic hyperplasia. If there was any doubt, aspiration should be carried out, and if the lump was found to be a cyst, operation should be deferred. If a lump was to be excised for biopsy, a large incision should be made with the patient under general anaesthesia, and a considerable area of breast should be excised with an ellipse of skin. The skin incision should extend from the nipple to the periphery of the breast.

S. H. LOVELL (New South Wales) said that Dr. Thomas had struck an important note in his report of the case of a woman who had presented with sciatic pain due to a metastasis from a previously undetected carcinoma of the breast. In recent times, the focus of attention had been on the remarkable measures for improving the lot of those suffering from advanced cancer, but little effort was made to discover more patients with Stage I cancers—those who had a considerable prospect of cure. With all the new developments, it was still true that if a patient developed

cancer her chances of recovery really depended on her getting a cancer of low-grade malignancy and receiving early and efficient treatment. Dr. Lovell said that he had been impressed by the odd early cases which had been found by physicians during examination of a patient's chest or heart, and by others during a routine overhaul; it was his own practice to conduct an examination for superficial cancer on all patients, whatever their symptoms. Dr. Lovell made a plea for a wider application of that practice, in the hope that more early cancers might be detected.

W. A. HILLMAN (New South Wales) referred to the case in which cystic hyperplasia was present with numerous lumps, one of which was hard. He asked what was the proper management.

Dr. Thomas, in reply to Dr. Hillman, said that the hard lump should certainly be removed. Referring to aspiration biopsy, Dr. Thomas said that he had on two occasions removed a cyst, in the wall of which carcinoma had been found. Referring to biopsy excision, Dr. Thomas said that he always carried out a wide excision as suggested by Sir Hugh Poate. In reply to Dr. Lovell, Dr. Thomas said that for some years it had been his custom to examine the breasts of all patients who came to him.

#### Unsatisfactory Results and Hazards After Cholecystectomy.

S. H. LOVELL (New South Wales) presented a paper entitled "Unsatisfactory Results After Cholecystectomy". He said that gall-bladder disease was comparatively common in Australia, and his paper directed attention to the unsatisfactory results which sometimes followed cholecystectomy in the long-term sense. Unsatisfactory results were classified into two groups: (i) the so-called post-cholecystectomy syndrome; (ii) other types of unsatisfactory result.

The post-cholecystectomy syndrome was a rare sequel to an operation which had been performed for an advanced degree of pathology. Another interesting point was the rarity of jaundice in patients with this syndrome. The belief was clearly expressed that the principal factor in the incidence of the post-cholecystectomy syndrome was faulty selection of patients for operation, and that it was more common when the operation had been performed when the presenting symptom was not real pain, but flatulent dyspepsia, nausea, and biliousness and migraine. Less commonly, an erroneous diagnosis had been made, and the patient had really suffered from peptic ulcer, hiatus hernia, hypertrophic gastritis, appendicitis *et cetera*. In a much smaller group, some local cause would be found for the syndrome, such as residual stone in the common duct.

Dr. Lovell expressed the belief that when laparotomy was performed, the commonest finding was dense adhesion of the pyloro-duodenal segment to the inferior surface of the liver, but he admitted that it was difficult to correlate the finding with the symptoms. He suggested that when real pain was not the presenting symptom, and the presence of gall-stones had not been demonstrated, the surgeon should not make a hasty decision to recommend cholecystectomy, and that time spent on a careful assessment and review was not time wasted. A similar policy was advised when the surgeon was confronted with the post-cholecystectomy syndrome, as the findings at laparotomy were more likely to be negative than positive.

Dr. Lovell also made brief reference to some other types of unsatisfactory results, including delayed stricture of the common bile duct.

JAMES MACRAE YEATES (New South Wales) in a paper entitled "The Hazards After Cholecystectomy" reviewed the main complications (including deaths), which had followed 500 consecutive cholecystectomies performed at Sydney Hospital during the years 1949 to 1954. The patients were 110 men and 390 women. The average age was forty-eight years. The youngest woman was aged fifteen years, the oldest woman seventy-five years. For men the corresponding figures were twenty-six and seventy-two years. Stones were found in the gall-bladder in 426 cases (85.2%). The common duct was explored in 51 cases (10.2%). After exploration, 25 ducts were drained,

19 were sutured, and six were anastomosed to the duodenum; the last-mentioned method was adopted in cases in which rigidity of the duct prevented satisfactory dilatation. Stones were found in the common duct in 23 cases (4.6%). The duodenum was opened only twice. Serious chest complications, usually associated with pulmonary collapse, occurred in eight cases. The absence of death or permanent morbidity was attributed to the use of relaxant drugs in the hands of skilled anaesthetists. It was considered remarkable that there were no cases of pulmonary embolism, and only one case of venous thrombosis. Dr. Yeates said that that might be due partly to a readiness to give anticoagulants. In 13 cases there was evidence of hæmorrhage—in 10 in the wound and in three in the gall-bladder bed. On five occasions bile drained for a week or more through the drainage tube; two of the leaks followed duct suture. Wound infection was evident in 21 cases (4.2%). Apart from the delay in healing, infection was significant in that it often caused errors in diagnosis as to the cause of its remote effects, and subsequent errors in treatment. The condition of burst abdomen occurred four times (0.8%).

Five deaths followed the combined operation of gall-bladder removal and duct exploration (10%). Jaundice was present in three of these cases, and a cause for obstruction was found in all five, but post-mortem examination showed that in no less than four cases the duct had not been completely cleared. Five deaths also followed straight cholecystectomy; that gave a mortality rate of 1.1%, a figure which compared favourably with that from the Mayo Clinic for 1952 (0.8%). That rate appeared to approach an irreducible minimum, but critical inspection showed that all five deaths had been due to a lethal pool of blood, bile or pus. Including three deaths from similar causes in the combined operation series, eight fatalities had been immediately due to leakage. Dr. Yeates stressed the view that very early laparotomy was the only treatment likely to avail in such cases. Failure in that regard was due to faulty appreciation of the cause and a fatal penchant for treating effects with eminently appropriate drugs which masked the symptoms of the unrelenting peritonitis until it was too late.

In conclusion, Dr. Yeates pointed out that it was the vintage gall-bladder which was most dangerous to remove; that when stones were allowed time to migrate into the common duct the death rate rose steeply (from 1.1% to 18.2%); and that, although the average age of the 500 patients was forty-eight years, the average of the 10 who died was sixty-three years. In the light of those figures it was felt that the public could assist in improving results by seeking early surgical treatment, once the presence of gall-stones was proven. Dr. Yeates finally reminded both patient, and even some doctors, that there was still no mythical potion which would dissolve stones, whether they were gall or otherwise.

J. H. HOOD (New South Wales) read a paper entitled "Use of 'Biligrain' Medium in Gall-Bladder Surgery". He said that approximately twenty minutes after intravenous injection of "Biligrain", it could be seen in the bile ducts and in the duodenum; visualization of the gall-bladder took longer, filling occurring in from one to four hours after injection. With conventional oral media demonstration of the ducts was fortuitous, depending on the correct functioning of the liver and gall-bladder. Dr. Hood said that after cholecystectomy the bile ducts usually became dilated; this could be demonstrated by using "Biligrain". That medium also enabled the gall-bladder, and sometimes calculi, to be visualized after the orally administered media had failed.

B. T. EDEY (New South Wales), in opening the discussion, said that he was in entire agreement with Dr. Lovell. Dr. Edey believed that, even when the diagnosis of cholelithiasis was conclusive, radiological examination of the gastro-intestinal tract was an advantage, and was necessary when any doubt remained. Dr. Lovell had emphasized the importance of caution in assessing borderline cases. Dr. Edey said that if, finally, an operation was undertaken, the surgeon should be prepared to remove the gall-bladder after excluding other pathological lesions, even if no stones

were detected and the gall-bladder appeared normal to the naked eye. Examination of such a gall-bladder, when it was opened, might reveal cholesterosis of the mucosa, a not uncommon cause of dyspepsia, and even acute attacks of pain. Dr. Edye said that he had formed an impression that a long, tortuous and narrow cystic duct might impede function and thereby create symptoms. With regard to the post-cholecystectomy syndrome, Dr. Edye said that he assumed that term was applicable to those cases in which the more usual pathological lesions had been excluded by careful and repeated investigation. If the symptoms could be tolerated, it might be wise to allow the patient to carry on after reassurance and advice concerning treatment. However, if the patient was unhappy and an operation was considered, the plan suggested by Dr. Lovell should be followed. Dr. Edye said that his routine was to separate adhesions, exclude other causes, open and explore the common bile duct, and carefully prove the patency of the papilla of Vater, even transduodenally if necessary, and placing omentum between the duodenum and the liver.

With reference to Dr. Yeates's paper, Dr. Edye commended the informative results of his analysis of 500 cases of cholecystectomy.

Dr. Edye then said that Dr. Hood's statement on the value of "Biligradin" medium in displaying the bile ducts was useful. The method was new to most of those present, and they were glad to learn something of its possibilities. Dr. Edye asked Dr. Yeates two questions. The first was what the risks were, and how to avoid them. The second was whether, if the diseased gall-bladder had ceased to function, the method revealed dilatation of the common bile duct.

N. G. SUTTON (Queensland) said that he could add one more rare cause of trouble following cholecystectomy—namely, cutting the cystic duct too short. In two of his cases he had removed a ligature from the common bile duct, in one a linen suture and in the other a silk suture. Both patients presented with jaundice.

B. L. DEANS (Victoria) commented on the manner in which common bile duct stones moved and might temporarily lodge in the intrahepatic ducts, and he quoted a case.

P. BRAITHWAITE (Tasmania) pleaded for more aggressive treatment for post-operative atelectasis.

S. L. SPENCER (New South Wales) supported Dr. Lovell in his plea for caution in the management of the non-calculous gall-bladder, but said that it had been his experience on a number of occasions to open the abdomen for presumed gall-bladder disease only to find that the gall-bladder organ presented a relatively normal external appearance with no palpable stones. When a thorough search of the abdomen showed no other explanation for the patient's symptoms, Dr. Spencer considered that the gall-bladder should be removed; and, in the majority of instances, he had found on opening the organ that it contained stones or other definite evidence of pathological change. Referring to the fact that one of the speakers had mentioned the incidence of back pain following the use of an excessively high gall-bladder rest, Dr. Spencer said that he had not used a gall-bladder rest for over ten years and that he had not felt that the exposure was any less satisfactory without that appliance. He strongly suspected that the use of a gall-bladder rest was dictated by habit rather than by sound logic.

Dr. Lovell, in reply, said that he agreed with Dr. Spencer. The gall-bladder should be removed even if it was apparently normal. Dr. Lovell thought that the gall-bladder support was a help in his hands. He gave figures to show how much more common strictures were in America than in Australia.

Dr. Yeates, in reply, said that operation for acute cholecystitis was fairly rare at Sydney Hospital. He agreed with the chairman, who had said that the figure of 10% only of patients being subjected to duct exploration was rather too low.

Dr. Hood, in reply, said that all patients who were given "Biligradin" had received an injection of one cubic centi-

metre, and there was a delay of half an hour before the investigation was proceeded with. No severe anaphylactic reaction had been encountered. Forty cubic centimetres were then given by injection.

#### The New Outlook in the Surgery of Toxic Goitre.

SIR HUGH POATE (New South Wales) presented a paper entitled "The New Outlook in the Surgery of Toxic Goitre", in which he gave a brief review of fifty years' personal interest and surgical experience dating from experimental work as a student in 1905 and followed up during a term as resident medical officer at the Royal Prince Alfred Hospital in Dr. R. Scot Skirving's ward. Sir Hugh Poate said that, interestingly enough, that long period of experience fell into fairly well-defined decades, each of which had interesting developments showing continuous progress in that branch of surgery. In the earlier days toxic goitre was considered the prerogative of the physician, who called in the surgeon as a last hope; but owing to the influence of Sir Thomas Dunhill in Melbourne, followed by that of the late Sir Alan Newton in Melbourne and of himself (Sir Hugh Poate) in Sydney, the surgeons gradually took over the treatment of those patients in their entirety. With the advent of the anti-thyroid drugs during the last decade, the physicians (and even general practitioners) were again undertaking the treatment of toxic thyroid conditions, and the surgeons once more were being left with the task of dealing with their failures. Like many of the newer therapeutic introductions, well exemplified by the sulphonamides and the antibiotics, the anti-thyroid drugs had been modified, improved and better understood, so that at present their toxic effects were few and far between, whilst their therapeutic results had been enhanced. Sir Hugh Poate referred in general terms to the correct use of the anti-thyroid drugs. He said that operation should no longer be regarded as a matter of urgency, since it was now realized that hyperthyroidism was readily controllable; but it took time to repair the ravages of the disease, especially the upset of the nervous mechanism, both cerebro-spinal and autonomic. Until a condition of stability had been established, operation should be deferred; that could be done with safety to the patient, a rapid convalescence after operation being ensured. The use of radioactive iodine was not without promise, but required a highly specialized technique and equipment as well as regular supplies. At present the main interest in Australia lay in its diagnostic import; but within a few years it might be possible to secure regular and adequate supplies within Australia.

S. L. SPENCER (New South Wales), in opening the discussion, said that he felt satisfied that all would agree that the occasion was a memorable one. In Australia Sir Hugh Poate occupied a unique position with regard to thyroid disease. He personified the surgeon who was "a physician who operated" and had shown himself able to follow and evaluate any method of treating thyrotoxicosis, medical or surgical, which seemed to offer a prospect of fruitful results. He had been unflagging in his interest and unremitting in his willingness to teach colleagues and students. Sir Hugh Poate's exhaustive inquiry into the use and value of the anti-thyroid drugs had typified his interest in non-surgical methods.

Dr. Spencer said that the cause of thyrotoxicosis was unknown, but seemed certainly to lie outside the thyroid gland. For that reason, thyroidectomy as a method of treatment was not logically based. When the jet engine was first introduced, its advocates had described the piston engine as "a poor idea saved by brilliant engineering". Dr. Spencer thought that a similar criticism might be offered in regard to the treatment of thyrotoxicosis by subtotal thyroidectomy. The method was crudely conceived, but had been brilliantly carried out, the success which had followed its use being due in no small measure to the assistance received from anaesthetists, biochemists and others. In fact, it was perhaps incorrect nowadays to speak of operating for thyrotoxicosis; since with the methods at his disposal the surgeon no longer operated on toxic patients, but insisted that their toxicity should be adequately controlled before they were submitted to



surgery. Despite its theoretical shortcomings, thyroidectomy remained the standard treatment for thyrotoxicosis, and was the yardstick against which other methods must be compared. Dr. Spencer said that the therapeutic pendulum had swung back and forth over the years. That was a good thing; for when the pendulum stopped, the clock stopped too. The antithyroid drugs had a valuable place, both definitive and in the preparation of patients for operation. Dr. Spencer thought that the present was probably the "Golden Age" of the surgery of thyrotoxicosis and that better and non-surgical methods in the control of the disease would inevitably emerge.

F. F. RUNDLE (New South Wales) described his experience in the treatment of 25 subjects of thyrotoxicosis with  $I^{131}$ . All but two of the patients had toxic diffuse goitre. In all but one the thyrotoxicosis was adequately controlled by the treatment, and there had been no complication apart from hypothyroidism in a small proportion of cases. Dr. Rundle said that if sledge-hammer dosage was used, a reasonably quick result was obtained, but there was a high incidence of hypothyroidism. An attempt had been made to avoid hypothyroidism by the use of cautious doses, but the treatment then became protracted; the greatest period of treatment in the series of 25 patients to which he had referred had been nine months. Referring to the use of the  $I^{131}$  uptake test in the diagnostic field, Dr. Rundle said that the use of  $I^{131}$  was most valuable in differentiating anxiety states from thyrotoxicosis. Patients with anxiety states often had a raised basal metabolic rate.

SIR STANFORD CADE (United Kingdom) spoke chiefly in reference to the use of radioisotopes. He felt that the use of small tracer doses for investigation was of very great value and free from material danger. The use of larger doses for the treatment of thyrotoxicosis was, however, another matter. Sir Stanford Cade said he had seen a considerable number of cases of cancer of the skin of the neck in patients who previously had had the thyroid gland treated by X rays for thyrotoxicosis, and he felt very strongly that care should be taken not to repeat that mistake by using radioiodine therapeutically in the management of thyrotoxicosis. He deplored the use of a known carcinogenic agent in the present state of incomplete knowledge, particularly when surgery could afford such good results.

#### The Aggressive Treatment of Metastases.

EDWARD WILSON (New South Wales) presented a paper entitled "The Aggressive Treatment of Metastases". He said that his paper was concerned with the treatment of metastases, with emphasis on the possibility of salvage of patients who would otherwise be doomed. By aggressive treatment of metastases was meant an early search for metastases and their destruction or removal before being provoked to attack them in order to obtain relief from symptoms. The diagnosis of metastases was discussed, and the various biochemical tests were listed which might be of value in the diagnosis of metastases, particularly after removal of the primary tumour. The use of vital staining of lymphatics and lymph glands in detecting metastases of carcinoma of the colon, stomach *et cetera* was mentioned. The present position of cancer chemotherapy was summarized, with special reference to testosterone, oestrogens and cortisone.

The surgical treatment of metastases (including its history, indications, methods and results) was considered under the headings of (i) treatment at the time of the primary operation, (ii) treatment whenever metastases were detected clinically or by various tests, (iii) oophorectomy, orchidectomy, bilateral adrenalectomy and hypophysectomy, and (iv) routine reexploration of the abdominal cavity and other sites after a limited period of time had elapsed, while the patient was still symptom-free, and before metastases were detected by other means. It was concluded that such reexploration was definitely of value in certain cases. Reexploration by operation was considered superior to peritoneoscopy for the early detection of metastases. Unless there were irremovable metastases at the primary operation or unless the general condition was

poor, reexploration of the abdominal cavity was advised within three to six months in cases of carcinoma of the colon, ovary, liver, pancreas and rectum (unless the latter was an "A" case), even though there was no evidence of any metastasis. Reexploration was repeated until no metastasis was found. Reexploration was advised slightly earlier in cases of carcinoma of the stomach. Reexploration of other sites, such as the perineum after excision of the rectum, was sometimes advised. Reexploration was not recommended for cancers which were notorious for their venous spread (such as renal carcinomata) or for certain cancers whose metastases might respond favourably to irradiation (such as seminomata). It was also not recommended if many years of apparent freedom from metastases had elapsed.

Reference was made to the improved results of uretero-sigmoid anastomosis, pelvic evisceration, partial hepatectomy, multiple visceral resection and other procedures which had permitted more efficient surgical attacks on metastases.

Dr. Wilson described some personal cases and made suggestions for the further study of the treatment of cancer and its metastases.

KATHLEEN CUNNINGHAM (New South Wales) said that she wished to bring up three points which she hoped would be provocative. The first one related to an aggressive treatment for the relief of pain, and the other two were connected with aggressive treatment of metastases by hormonal means. Dr. Cunningham said that Sir Stanford Cade, in a recent lecture on the treatment of inoperable carcinoma, had stressed his personal dislike of using unlimited morphine therapy for a considerable time; he reserved treatment by morphine and its derivatives for the terminal stages of the disease. If a patient had intractable pain he advised leucotomy rather than chordotomy, which was a more difficult and risky operation.

Dr. Cunningham's second point related to the treatment of carcinoma of the breast with metastases by an attack on the hormonal medium in which it flourished. She said that only 40% to 50% of patients responded to the withdrawal of hormones by means of adrenalectomy and oophorectomy, but the condition of those patients would not be improved by the use of any other known method, and when they had been abandoned to their fate, it was possible to offer them almost a fifty-fifty chance of what was sometimes miraculous relief. In Dr. Cunningham's opinion it was the treatment of choice in premenopausal women who had stage III or stage IV carcinoma. She had seen multiple pulmonary metastases recalcify and the patients return to a nearly normal life. They were able to look after their homes and children and carry on reasonable activity. That continued up to within a few days of their death; and even if their objective improvement was not satisfactory, they felt well and ate well. Dr. Cunningham said that the deaths that she had knowledge of had all been sudden, the patient having been in a coma lasting about twenty-four hours. One example of aggressive treatment had been seen in a patient who had undergone adrenalectomy eighteen months previously. Her third lumbar vertebra, which had been collapsed, had recalcified. Unfortunately there was root pressure, and she developed left-sided obturator pain. Dr. Denis Rowe performed a chip-bone graft of the lumbar part of her spine and splinted the vertebrae, and the patient left the hospital two months later smiling and happy with complete relief from her pain. Dr. Cunningham said that she knew of no other metastatic bone which had been grafted with success. Referring to adrenalectomy and oophorectomy, Dr. Cunningham said that if the operation was going to be a success, the relief of pain was dramatic and almost instantaneous; patients who had not been able to move for four or five months were able to get out of bed four or five days after the operation. Dr. Cunningham had had no experience of hypophysectomy, but she was quite willing to submit patients to it if they did not gain benefit from adrenalectomy. Sir Stanford Cade had a series of 14 cases, but it was too early to evaluate the results.

Passing to her third point, Dr. Cunningham said that in the past five years she had had considerable experience of the attack on metastatic carcinoma of the breast by hormonal methods. After five years' experience of the administration of testosterone to patients suffering from carcinoma of the breast with metastases, she had come to the conclusion that that hormone should not be used for female patients. She said that it was true that recalcification of skeletal metastases occurred, although it seemed to have no effect on visceral metastases. However, the side effects and disadvantages of the hormone in female subjects were so great that they completely outweighed the temporary benefit obtained. It should be emphasized that the benefit was only temporary; there was improvement in relation to metastases for from seven to at the most twelve months, after which the disease seemed to become reactivated, and the patient died rapidly of extensive secondary lesions. The important question was what had been done to the patients while the temporary improvement was going on. First, they were given hirsutism, severe acne and baldness of the male type; Dr. Cunningham had seen patients lose all the hair from the crown of the head, being left with a little fringe around the edges of the scalp. She commented that those side effects would not matter—they were cosmetic and could be dealt with—but the side effect which had made her abandon the treatment was the change in the personality of the patient. In the male subject with his adequate androgens, qualities of leadership, aggressiveness and even dictatorship were accompanied by corresponding masculine charm, which was appreciated by his nearest female relatives. In the female subjects who were packed full of artificial androgens, the picture was different; they became aggressive, argumentative, quarrelsome and almost impossible to live with; they lost all their feminine attributes and charm and became viragos with no compensating softness. Dr. Cunningham quoted the words of one of her anaesthetists: "If I am to die of a carcinoma of the breast, please let me die feminine and not acting like those dreadful creatures." Dr. Cunningham urged her listeners not to heed the wily talk of the chemical travellers. She had completely abandoned the use of the hormone in metastatic carcinoma of the breast.

In conclusion, Dr. Cunningham said that she would like to stress that the patient with metastatic carcinoma should not be abandoned to her fate. The medical attendant should keep trying and should try some of the newer methods, and so would earn the gratitude of the patient, and occasionally would have a miraculous success which would make all the efforts worth while.

#### Repair of Hernia with Silver Wire Filigree.

L. H. BALL (Victoria) said that the use of silver wire filigree for the repair of hernia had been first described by McGavin in 1909, and the method had been introduced to Melbourne by the late R. C. Brown soon after that time. The filigree was made of 32 gauge silver wire and for inguinal hernia was placed under the *fascia transversalis*, extending from the pubis to the internal ring, but no attempt was made to fix the filigree in that position. Tissue reaction caused a dense plaque of fibrous tissue to form in the posterior wall of the inguinal canal. During the past ten years the method had been used by Dr. Ball and his colleagues in nearly 500 cases, with only one known recurrence. In the type of case under review the patients were predominantly old or with poor musculature or suffering from recurrent hernia; so that the proportion of cases of hernia in which a filigree was used was 44.5%, a figure rather higher than one would expect if all herniae were included.

J. C. BELL ALLEN (New South Wales), in opening the discussion, said that in the repair of the indirect inguinal hernia when the canal anatomy appeared normal, it was, of course, necessary only to remove the peritoneal sac. When posterior wall deficiencies occurred, the sac was not a problem; but the efficient repair of the posterior wall was a very difficult surgical problem for which many methods had been evolved from time to time—all of which,

no doubt, had advantages under certain circumstances, but not one of which had produced uniformly satisfactory results.

Dr. Bell Allen went on to say that in the repair of certain types of herniae, such as the sliding variety, when no posterior wall existed and when there was no peritoneal sac which could be used for fixation of the descending colon, the filigree method should theoretically have a definite place. In the repair of some of the large direct herniae, and of the recurrent variety with the loss of the posterior inguinal canal wall and inadequate normal tissue in the area that could be effectively utilized, filigree might again have a place. Dr. Bell Allen said that he himself was nervous of using filigree, as it was recognized that there was a small irreducible percentage of infection following a herniorrhaphy, due to disturbance of the sac, which had become infected from its bowel contents, particularly when minor degrees of obstruction or congestion had led to exudate into the sac. While he was in England in the middle 1920's, he had on a number of occasions attempted to remove pieces of wire from inguinal areas where infection followed by multiple sinuses had occurred after a McGavin type of operation had been carried out. The procedure was more than tedious, and in fact impossible. As a consequence, he preferred to use normal suture material, which could be removed without undue difficulty. Skin grafting of that area, while it had certain theoretical disadvantages, such as the formation of epidermal cysts and stretching, was at times a useful procedure. He had not been impressed with silk lacing, or with the Gallie type of operation.

A. A. WEARNE (Canberra, A.C.T.) asked how results in relation to post-operative pain compared with those from other methods. He also asked Dr. Ball if he fixed the filigree to the transversalis fascia. Finally he asked Dr. Ball if he had used Henry's incision to facilitate the insertion of filigree behind the transversalis fascia in bilateral hernia operations.

Dr. Ball, in reply, said that he never fixed the filigree, as fixing tended to cause buckling of the filigree. He said that he had never used Henry's incision. Cole recommended that with bilateral operation for hernia with filigree the two halves of the operation should never be performed together; but Dr. Ball did not agree with that.

#### Plasma Expanders.

R. J. WALSH (New South Wales) presented a paper on "Plasma Expanders". He said that the most useful plasma expander was unquestionably human blood, but it suffered from the disadvantage that the erythrocyte had a limited lifetime *in vitro*. Human serum could be stored for long periods in both liquid and dried forms, but its use was associated with a definite risk that homologous serum hepatitis would follow at an interval varying between forty and one hundred and sixty days after injection. Albumin prepared from serum was now available in Australia in a 25% solution and was probably the most satisfactory plasma expander in use. It did not contain hepatotoxic properties, was stable in solution, was easily administered and could be used in association with electrolytic solutions of any desired composition. It was thought that albumin would ultimately replace serum in resuscitation work. The search for a plasma expander of other than human origin had been in progress for more than thirty years, but it was probable that the ideal material had not yet been discovered. Those currently in use—the dextrans and polyvinyl pyrrolidone—appeared to be more satisfactory than any other materials investigated to date, but they were not entirely free of unphysiological effects. Nevertheless, any plan of civil defence must include the stockpiling of large amounts of dextran and polyvinyl pyrrolidone. Resuscitation would be one of the major medical problems in any future war, and it would be impossible to obtain more than a fraction of the anticipated requirements of plasma expanders from human sources.

Dr. Walsh offered some provocative criticisms of resuscitation procedures in civil practice at the present time.

Dr. Walsh went on to say that it was not sufficiently well recognized that, with few exceptions, "shock was

hæmorrhage" and that it was best treated by transfusions of blood. It was probable that plasma expanders not of human origin were used too frequently and that albumin was not used as often as it should be. Finally, the occurrence of homologous serum hepatitis was the basis of the statement that albumin should replace serum.

F. F. RUNDLE (New South Wales) asked Dr. Walsh whether the privileges of the blood bank were being abused. He went on to say that in all major operations (bigger than those for hernia) he thought that the patient should have a hæmoglobin estimation carried out, and the value should be brought up to normal before operation.

B. A. COOK (New South Wales) asked what was the best fluid to use and in what quantities in a case of profound traumatic and surgical shock without exterior loss of blood.

Dr. Walsh, in reply, agreed with Dr. Rundle that the hæmodynamics of any patient should be made as near normal as possible before operation; but he wondered how many surgeons knew the correct hæmoglobin value for each age group *et cetera*. In reply to Dr. Cook, Dr. Walsh said that he could not generalize on how much blood should be given. Some Americans had used amounts of blood two or three times the normal blood volume, but others gave less. He advised being guided by the blood pressure.

#### Renal Tumours.

ALBAN GEE (New South Wales) presented a paper on renal tumours. He said that it must be realized that at present, by the time treatment was initiated, about 70% of renal tumours had already spread beyond the confines of the kidney. Better results in the future could come only from earlier investigations and improved surgical technique, and closer consideration must be given to the urinary tract of those over forty years of age. Less than 50% of patients presented with the classical triad of hæmaturia, pain and a mass in the side.

Any bleeding from the urinary tract must always be investigated, and this must not be postponed until a further episode occurred. The significance of microscopic hæmaturia should also receive more attention than it had done to date. From the kidney the bleeding was usually painless, but there might be some clot colic. Its colour could vary from bright red through darker shades to smoky. Not uncommonly it had been mistaken for uterine bleeding. With immediate investigation of any bleeding, a very great proportion of the growths of the urinary tract could be successfully treated.

The pain experienced was not severe, and was rather an ache or dragging sensation. It was not uncommonly taken as muscular, but was unaffected by posture or movement. It might be not only in the loin but also in the upper part of the abdomen, and for that reason the renal tracts must not be forgotten in searching for the source of such a pain.

A palpable tumour was found in 35% of cases. It was often slow-growing, but must be regarded as an advanced state. It was hard, with a margin that was usually palpable; and if limited in movement it was usually adherent to surrounding structures.

Gastric symptoms were not uncommon, and might be the first complaint. That was not well recognized, and earlier renal investigations should be carried out when the results of the examination of the stomach proved negative. Modern urological investigations were very accurate, depending for the most part on visual cystoscopic examinations or clear pyelogram definitions. They were aided in doubtful cases by aortograms, and perirenal pneumograms. Exfoliative cytology was at times a help, but in renal parenchymal lesions it had been disappointing.

Treatment was essentially surgical, aided by deep X-ray therapy, and even in advanced cases considerable relief could be given. Today, few tumours were considered inoperable, because of advances in anaesthesia and newer surgical techniques. The lumbar (subcostal) incision was still widely used, but was below the kidney and necessitated too much handling. The thoraco-lumbar approach had been used with larger tumours, but had the risk of

pleural or peritoneal complications. An incision which gave exposure comparable to the thoraco-abdominal approach, but without the risk of complications, would be preferable. It was achieved by an incision along the line of the twelfth rib, extended dorsally along the margin of the sacro-spinalis to above the eleventh rib. The twelfth rib, and one inch of the eleventh rib medial to its angle, were removed. That allowed elevation of the rib cage with wide exposure of the subdiaphragmatic region without entering the pleural or peritoneal cavities.

R. G. S. HARRIS (New South Wales) supported Dr. Gee's plea for early diagnosis. He agreed that hæmaturia was due to cancer until proved otherwise. He said that with papillomata of the bladder it was important to ensure that there was not a primary lesion in the renal pelvis. He commended the incision suggested by Dr. Gee, as it gave excellent exposure of the pedicle and thus allowed attention to be paid to it early in the operation.

A. H. LENDON (South Australia) asked whether Dr. Gee had noticed the association of hypertension with renal tumours, especially in young people.

T. F. ROSE (New South Wales) asked whether Dr. Gee had noticed that the removal of the primary tumour affected the secondary deposits.

Dr. Gee, in reply, said that he could not recall a case such as Dr. Lendon had mentioned. He had noticed a similar thing with a cyst—the opening and excision of the cyst caused a fall in blood pressure. In answer to Dr. Rose's question, Dr. Gee said that he had not had a case in which he had noticed regression of secondary deposits; in fact, some people thought that handling the primary lesions accelerated the secondary deposits.

#### The Diagnosis of Early Acute Appendicitis.

THOMAS F. ROSE (New South Wales) discussed some difficulties in the diagnosis of early acute appendicitis. He said that in spite of the fact that acute appendicitis had been known for 143 years and its correct treatment for seventy-one years, its continuing mortality rate was still too high, as shown by statistics from New South Wales, the United States of America, and England. The cause of the high mortality rate was delay in early operation, whereby the inflammatory process was allowed to spread beyond the appendix. There were two main causes for this delay: (i) Delay in the patient's receiving medical attention was often associated with the giving of purgatives. (ii) Delay might be caused by the medical attendant in two ways: (a) though the condition had been diagnosed correctly, he delayed operation by treating it with antibiotics; or (b) he failed to recognize early acute appendicitis by reason of diagnostic difficulties. The latter was the most important cause of delay in operation for early acute appendicitis.

Dr. Rose pointed out that the symptomatology of a case of acute appendicitis was dependent on the position of the organ, and an unusual position produced unusual symptoms. The classical symptomatology was applicable to only a percentage of cases. Nevertheless, the combination of the symptom of pain and the signs of tenderness and change in bowel habits should be enough to establish the diagnosis of an acute abdominal emergency requiring operation, even if the diagnostician could not localize the disease to the appendix.

Dr. Rose then discussed various syndromes of acute appendicitis. He said that in many cases the condition was preceded by similar minor attacks of abdominal pain, appendicectomy for which would have prevented the onset of the more dangerous attack. Again, it was pointed out that those premonitory attacks might be very difficult to diagnose if the appendix was in an unusual position, so that such conditions as duodenal ulcer, chronic cholecystitis and colitis might be diagnosed for years before the acute attack led to operation and to the correct diagnosis. To prevent that, all patients with recurrent abdominal pain should be thoroughly investigated, especially radiologically. In such a case, the finding by a barium meal and follow-through X-ray examination of a non-filling appendix with



tenderness over the caecum, all other abdominal disease being excluded, should be followed by appendicectomy.

N. ST. C. MULHEARN (New South Wales), in opening the discussion, drew attention to the 63 deaths from acute appendicitis which had occurred in 1953. He said that a large number of them must have been avoidable deaths of previously healthy people with a normal expectation of life. For those patients early diagnosis and prompt treatment would have completely altered the picture. Dr. Mulhearn went on to say that the difficulties in diagnosis occurred only in a limited number of cases of insidious onset, or when the clinical signs were difficult to elicit, because of the unusual position of the appendix or obesity

of the subject, or in difficult children. A reduction of the mortality rate could be expected if a better assessment was made of the early symptoms and signs after a careful history had been taken and a thorough examination made, with particular attention to that cardinal sign—tenderness.

A. SHARP (New South Wales) asked how Dr. Rose dealt with a child with periumbilical pain which was probably due to mesenteric adenitis.

Dr. Rose, in reply to Dr. Sharp, said that if there was any doubt, and especially if the appendix did not fill with contrast medium on X-ray examination, he had no hesitation in recommending appendicectomy.

## Section of Tropical Medicine.

*President:* Professor A. H. Baldwin, M.B., B.S., D.P.H., D.T.M.&H., F.R.A.C.P., New South Wales.

*Vice-Presidents:* D. A. Dowling, M.B., B.S., D.P.H., Queensland; C. E. G. Beveridge, M.A., B.Sc., M.R.C.S., L.R.C.P., Victoria; C. M. Deland, M.B., B.S., D.P.H., D.T.M., South Australia; W. S. Davidson, M.B., Ch.B., D.P.H., Western Australia.

*Honorary Secretary:* Dr. C. J. N. Leleu.

### President's Address.

A. H. BALDWIN (New South Wales) took as the subject of his president's address "Disease and Development in the Northern Territory". He described the development of the tropical settlements in the Northern Territory from the earliest British station in 1824 up to the present time. Dr. Baldwin said that the subject could be conveniently divided into four periods: (a) the early British settlements, (b) a period of complete neglect, (c) South Australian administration, (d) Commonwealth control. Each of those periods had its own characteristic disease picture, and, furthermore, an intelligent study of the ecological factors of the locality, combined with a consideration of the nature of the settlers, would have enabled the nature of the subsequent morbidity to be anticipated and an estimate of its frequency made. Dr. Baldwin then discussed the probable nature of the future economical development of the Territory, and suggested that it should be possible in the future, as it had been in the past, to come to a reasonable estimate of the nature and frequency of the diseases likely to be met with. He thought that a great deal of time, labour and money could be saved by careful planning. That was not merely a matter of medical concern, but involved also agriculturists, veterinarians, settlement planners, and engineers, both mining and civil. Dr. Baldwin believed that a committee, purely advisory in character, could best give such advice on mining, pastoral and industrial problems. Such a committee should meet regularly, at least once a year, and in the Territory itself. Its composition should include officers from the Territory services and independent experts from the rest of Australia. Air services had solved the objection that meeting in the Territory was an undue waste of time for important specialists. The value of such a committee would be increased if all professional education in Australia devoted attention to tropical problems. As far as the medical profession was concerned, that would consist of the following measures: (a) Attention to the education of undergraduates, especially in relation to medical emergencies in that specialty. (b) The collection of tropical diseases in one hospital and in one ward in each State; that provided better treatment for the patient and maximum training facilities for teaching purposes. (c) Provision of one or two scholarships each year for the training of specialists abroad. (d) Making sure that at least one Australian representative attended each main international congress on tropical medicine abroad.

### Sprue in Aborigines.

R. A. DOUGLAS, R. A. RIMINGTON, L. J. McKELVIE and T. B. GREGG (Queensland) presented a paper on sprue in aborigines. They stated that so far as they could determine sprue had never been described in Australian aborigines. It was usually regarded as being a very rare disease in dark-skinned peoples. It was essentially a disease of Europeans who were living in a tropical or subtropical climate, or who had lived in such a climate, exclusive of tropical Africa. Breinl and Priestley (1917) had stated that amongst the tropical diseases occurring in north Queensland sprue played an important role. Cilento (1942) had stated that the condition was becoming very rare in north Queensland. The observations recorded in the present paper had recently led Dr. Douglas and his colleagues to believe that it was very rare among the European community. Older practitioners had noticed the decline in frequency of the disease since the early 1920's.

The five cases described occurred in four full-blooded aborigines and one half-caste aboriginal from the Palm Island Aboriginal Settlement. The cases were all encountered over a period of eighteen months, and constituted a relatively high incidence of severe sprue. The clinical features of the cases were presented in detail.

It was pointed out that the sexes were about equally divided, and the average age was thirty years. All patients had severe weight loss and diarrhoea, though diarrhoea was never the presenting complaint. Aphthous stomatitis was present or had recently been present in all. Stippled pigmented patches on the borders of the tongue were noted in three cases; it was thought that that might be a new important sign to make one suspect the disease. It might be analogous to the cutaneous pigmentation sometimes seen in Europeans with the disease. The pigmentation seemed to fade with treatment. Splenomegaly was present in two cases, and fever was present in all. Those two findings were regarded as being due to the severity of the anaemia itself and as potential diagnostic "red herrings". The radiological "deficiency pattern" in the small intestine, as described by Fraser, was present in all cases. The percentage of fat in the dried faeces was raised in all cases, and there was an abnormally high ratio of split to unsplit fat, except in one case, in which reversal of the ratio occurred.

The first four patients were, from their haemoglobin levels, almost exsanguinated. In all cases the blood picture

was that of a macrocytic anaemia—in four cases with severe leucopenia and in three with diminished numbers of blood platelets as well. Bone marrow smears showed megaloblastic erythropoiesis in all cases. The serum calcium content was slightly low in three cases. The serum bilirubin content was normal in all. A histamine test meal examination revealed achlorhydria in all except one case, in which hyperchlorhydria was present. Pulmonary tuberculosis, leprosy and carbuncle were seen as associated diseases. No evidence of other vitamin deficiencies was detected.

With regard to aetiology, it was stated that the series of cases under discussion appeared to cast some light on the unknown aetiology of the disease. The American view, based on cases in the Caribbean, was that sprue was primarily a deficiency disease (Suarez). On the other hand, the British view was that sprue was primarily an intestinal infection with secondary deficiency manifestations (Manson-Bahr). The observations of Dr. Douglas and his colleagues inclined them to the belief that the British view was correct. It was possible that their patients were eating a deficient diet at Palm Island; but on the other hand, when sprue was common among Europeans in north Queensland there was no evidence of a defective diet. Other intestinal infections and infestations were common on Palm Island, but uncommon on the mainland. It was thought that sprue had tended to disappear on the mainland because of improvements in hygiene and sanitation, and that the aetiology of the disease could be inferred from the company it kept.

In treatment it had been decided to try first the effect of vitamin  $B_{12}$  by parenteral injection in a dose of 100 microgrammes daily in all cases. Three patients responded dramatically to vitamin  $B_{12}$ . In the two cases in which vitamin  $B_{12}$  had no effect, folic acid was used in a dose of 60 milligrammes daily with equally dramatic response. In each case, within a few days of the commencement of therapy, response was clinically obvious in general improvement in the patient's appearance, long before there could have been any important effect on the blood picture. It appeared that deficiency of vitamin  $B_{12}$  or folic acid produced nuclear disturbances in all body cells, the effect on the blood cells being the most easily detected. That might account for the appearance of well-being seen so soon after the commencement of the appropriate treatment. One European patient, a woman, who had been married twelve years and had never conceived, responded well to vitamin  $B_{12}$ , and they wondered why, in spite of apparently robust health, she had developed fainting turns about six weeks after her discharge from hospital; that mystified them for a time, until they found that she was pregnant.

In a deliberate attempt to simplify matters as much as possible, they had their patients on the ordinary ward diet and did not add any vitamins, relying entirely on a single therapeutic agent. All patients were restored to apparent health, apart from associated diseases, and all symptoms attributable to sprue vanished. Doubtless the basic intestinal upset remained (Woodruff).

S. D. WATSFORD (Northern Territory), who had spent four years in the Northern Territory, said that he was reluctant to venture into haematology. He had not met with any proven cases of sprue, but was interested in the problem of anaemia in aborigines. Amongst the natives in the Northern Territory there were many cases of severe anaemia, some being of a macrocytic type with megaloblastic bone marrow. Investigations had not revealed the cause in all cases, though many were associated with hookworm or poor diet. In some cases the condition responded only to vitamin  $B_{12}$  or folic acid. On cattle stations, where meat was abundant, cases were rare; and on a mission station, where the men were hunting and therefore on an adequate protein diet, no cases occurred among the men, though on the same station the women and children suffered severely.

A. H. BALDWIN (New South Wales) asked Dr. Douglas if he had seen any post-mortem examinations in cases of alleged sprue and, if so, what was the condition of the small intestine.

Dr. Douglas replied that he had not observed anything as the fatal cases had occurred before sprue was suspected. However, he recalled one case in which the small bowel was diaphanous in character.

#### Hæmoglobin Values of Pregnant Women in North Queensland.

W. R. HORSFALL (Queensland) read a paper on hæmoglobin values of pregnant women in north Queensland. He said that over a period of three years hæmoglobin estimations had been carried out on all pregnant women referred to the Commonwealth Health Laboratory, Cairns, for routine blood typing. Analysis of the results showed that the level fell as pregnancy progressed, and that the levels were lower in the summer than in the winter. There had been many investigations showing that there was a progressive fall in the hæmoglobin value in pregnancy. That had often been considered to be due to an increase in plasma volume, and it had been shown that the total hæmoglobin content of the body actually increased though the concentration decreased. However, some workers considered that the fall in hæmoglobin concentration was due to an iron-deficiency anaemia, as the fall was stopped by the administration of iron.

Dr. Horsfall went on to say that hæmoglobin was estimated as oxyhæmoglobin in an E.E.L. colorimeter. The machine had been standardized against blood flown up from Brisbane. The number of estimations carried out was 1290. The mean at the second month of pregnancy was 12.78 grammes *per centum* and that dropped to 11.68 grammes *per centum* at the seventh month, rising to 11.95 grammes *per centum* at the eighth month. That steady fall, with a rise at the end of pregnancy, was similar to the findings of others; but the values were slightly lower than those obtained in Sydney by Walsh. The analysis showed that the difference was significant in the early months of pregnancy, but not in the later months. When the figures as a whole were considered, the difference was highly significant. At the seventh month, the hæmoglobin value was below 10 grammes *per centum* in 5.7% of women in the winter and in 12.6% in the summer. The figure obtained by Walsh was 4%. One explanation of that seasonal variation was that the fall was due to physiological hæmodilution caused by the high summer temperature and high humidity. Walsh in Sydney had found seasonal differences in men and non-pregnant women, as had Lippincott in the southern United States. Possibly the fall was pathological and caused by a nutritional anaemia due to the diminished appetite and lower food intake that might occur in the summer time.

Dr. Horsfall said that there could be no doubt from the experimental evidence available that red cells and plasma increased during pregnancy, and that the fall in hæmoglobin concentration occurred because of the greater increase in plasma volume. He considered that iron certainly prevented much of that fall; but that did not necessarily indicate that there was an iron deficiency, and that iron in large amounts might have a pharmacological action in temporarily raising hæmoglobin levels in the woman who was not iron-deficient. It was suggested that a hæmoglobin value of 10 grammes *per centum* at the seventh month should be regarded as the lowest normal value, and that iron should be given in pregnancy only when iron deficiency was present. However, if diagnostic facilities were not available, iron should be given to all pregnant women.

R. J. WALSH (New South Wales) said that Dr. Horsfall's work had raised several points of physiology in the tropics. It was of interest that the mean values at different stages of pregnancy were comparable with those found in England and in the more temperate regions of Australia. The seasonal differences were of particular significance, because a similar trend had been observed in non-pregnant women and in men in Sydney. For similar groups lower values were found in summer than in winter. More specifically they had observed the same trend in individual subjects who were tested where the ambient temperature was 80° F., and again where the temperature was 98° F. To explain

the differences they had postulated that cutaneous vasodilatation in the warmer weather increased the volume of the lumina of the vessels, and that haemodilution followed the passage of fluids into the circulation from the intestinal fluids and from the intestines. It was probable that acclimatization with an increase of the circulating red cell mass would occur if the ambient temperature did not fall appreciably at night. Because of those observations it seemed more likely that the lower values in summer were the result of physiological vascular changes than that they were in any way associated with the nutrition of the pregnant woman.

Dr. Walsh said that he agreed with Dr. Horsfall's suggestion that all women should receive iron during pregnancy, but felt that that practice should not be restricted to the tropics. The danger of increasing the amount of iron in the body to toxic levels was probably least to the pregnant woman. It had been estimated that approximately 0.75 gramme of iron was lost to the fetus and during parturition and lactation. That amount must be replaced by absorption from the intestinal tract, and a supplemented intake was therefore advantageous.

#### Complement Fixation Test in Amœbiasis.

BRUCE HALL and H. L. CARRUTHERS (New South Wales) discussed the value of the complement fixation test in the diagnosis and management of amœbiasis. Dr. Hall said that for some years such tests had been performed at the Repatriation General Hospital, Concord, the School of Public Health and Tropical Medicine, University of Sydney, and Saint Vincent's Hospital, with American antigens and one prepared by Dr. T. C. Backhouse. Two hundred and six patients were examined; of these, 82 had been expected to give positive results, but only 49 did so while 124 had been expected to give negative results, and 105 did so; of the 19 who had given unexpected positive results, 18 were connected with infection after review. Further analysis of selected cases, and of patients tested before and after treatment, led to the conclusion that the test was reasonably specific, although a positive result should be supported by other evidence, and a negative result was not conclusive.

Dr. Carruthers covered the same ground and reached the same conclusions.

T. C. BACKHOUSE (New South Wales) said that he had abandoned the complement fixation test as originally performed at the School of Public Health and Tropical Medicine in Sydney, partly because of the difficulties of producing a reliable antigen in sufficient quantities. He thought that those difficulties might have arisen because of the great variety of strains of the *Entamoeba* necessary for a satisfactory antigen. Dr. Backhouse agreed with Dr. Hall that it was a useful test, but must be taken with other evidence in reaching a diagnosis, and he emphasized again that a multiple strain antigen must be employed.

R. B. MAYNARD (Victoria) said that he had earlier come to the conclusion that the test was too unreliable; but after hearing Dr. Hall's paper he was inclined to change his views in its favour. He thought that not infrequently some *Entamoeba histolytica* organisms isolated from suspected cases were avirulent and not in fact the cause of the presenting symptoms.

#### Leptospirosis in North Queensland.

E. H. DERRICK (Queensland) presented a paper on leptospirosis in north Queensland, in which he gave an epidemiological comparison of the various leptospiral serotypes. He said that 11 serotypes had been responsible for 219 cases of leptospirosis during the three years from 1951 to 1954. *Australis B* was responsible for 58 cases, *australis A* for 48, "*Kremastos*" for 22, "*Robinson*" for 17, "*Celledoni*" for 15, *hyos* for 15, *cunicola* for 12, "*Szwajizak*" for nine, *icterohæmorrhagicæ* for five, *medanensis* for four, and *pomona* for three; in 11 cases the type was not determined. Dr. Derrick said that there was considerable variation in geographical distribution, and analysed the incidence by

shires; he pointed out that to know the areas where the incidence of individual serotypes was comparatively high indicated where their ecology could best be studied. Persons employed in cane fields provided 54.8% of the cases; of the 48 *australis A* infections, 40 had occurred among cane field workers. No other serotype had shown any special association with cane field work, except perhaps "*Szwajizak*". There was almost a linear relation between the risk of acquiring leptospirosis and the amount of rainfall; in that respect no difference was detected among the serotypes. Reflecting the effect of the wet season (from January to March or April) was the occurrence of twice as many cases of the disease in the first half of the year as in the second. In most areas the majority of cane field infections also occurred during that period. However, in one area the higher incidence was in the second half of the year—the period during which the cane was harvested; that indicated that even in the dry season work in the cane fields carried a notable risk of infection. Flat and poorly drained cane fields, common in that particular area but not unknown in others, represented the largest single source of leptospiral infection in north Queensland, and offered a challenge to improved methods of prevention.

A. H. BALDWIN (New South Wales) agreed with Dr. Derrick that further research was desirable in areas other than the cane fields.

Another speaker drew attention to the manner in which the various epidemics of leptospirosis had varied in geographical distribution in Queensland without apparent reason. He thought that there was a fruitful field for research in that direction into the animal reservoirs and their distribution.

#### Tropical Ulcer and New Guinea Mouth.

C. M. DELAND (South Australia) read a paper entitled "*Tropical Ulcer and New Guinea Mouth*". He said that the two conditions were really one; they formed the third of the great endemic diseases of the islands. Yaws was the culprit, malaria was the killer, but tropical ulcer was the great labour waster. Dr. Deland said that tropical ulcer and New Guinea mouth were found at low levels throughout the islands; they were commonest in areas with heavy rainfall, but were not common in the true swamplands. They often appeared as explosive outbreaks as food supplies ran low. The causative organisms were a spirochete and a fusiform bacillus, well known as the cause of gingivitis and of Vincent's angina; whether the organisms were distinct or represented two stages of one organism was not of practical importance. The other factor in the aetiology of the diseases was malnutrition, and especially a partial deficiency of ascorbic acid. Dr. Deland described how the habitual chewing of betel nut gave rise to gingivitis due to Vincent's organism, and also led to copious salivation and indiscriminate expectoration. Small, disregarded abrasions of the legs were common, and those could easily be inoculated with the organisms which had been expectorated on to grass, sticks *et cetera*. It was noticeable that the Europeans who developed tropical ulcer were those who habitually wore shorts at their work.

Dr. Deland described how, within a few hours of inoculation, the site became acutely painful; within a day or so a bleb would form, containing thin greyish pus. The bleb soon broke and exposed the ulcer, with a greyish, sloughy base and undercut edges. Usually the ulcer would spread for a few days and then become arrested, with a diameter of three to four inches, and with its base at the deep fascia. An important feature was the layer of obliterative endarteritis beneath the floor of the ulcer. In more severe cases the ulcer might involve tendons, periosteum and muscle.

Dr. Deland stated that the introduction of penicillin had revolutionized treatment, but it was excessively costly and needed detailed hospital care, and it did not deal with the underlying endarteritis; so that it had to be kept for the privileged few and could not be used on a big scale in native hospitals, where conditions were primitive. If penicillin was used when the ulcer had progressed beyond



the early spreading stage, it was necessary to curette the base or else excise a thin slice of it to remove the layer of endarteritic tissue, and then to apply a skin graft. The treatment of the condition in a native hospital was a different matter. Two aims had to be borne in mind: to achieve the best possible result and to get the patient back to work as soon as possible. For medical assistants, missionaries, planters and other people, Dr. Deland had devised a simplified method. If the ulcer was spreading, it was to be scoured with 40% formaldehyde for thirty seconds or so—that would remove the slough; then the base was soaked with formaldehyde for another thirty seconds. The ulcer was then dried and filled with boracic powder. The formaldehyde had the effect of coagulating the endarteritis layer and sterilizing it. A black adherent scab would result—that must be kept dry. At the end of a week or so the scab would separate, leaving a clean granulating base which would heal quickly. Pinch grafts could be applied at that stage. If the ulcer was dirty, the same technique was used. However, when healing was well advanced but sloughs still remained, the sloughs could be dissolved by covering them with gauze moistened with Mencièr's solution and applying hot fomentations every three to four hours. To heal the ulcer, it must be covered with an occlusive dressing and disturbed as little as possible. Adhesive plaster was good, but the application of a light plaster of Paris cast was better. Dr. Deland stated that he had selected this system of treatment because of its ease and simplicity and because it could be learnt by people without technical knowledge. Its only defect was that the formalin was very painful, so that if possible a general anaesthetic must be used; intravenous anaesthesia was suitable, but open ether was safe and suitable; there was no need to induce deep anaesthesia. Dr. Deland explained that his paper had been written for the field officer who had no elaborate modern hospital facilities; the modern treatment of excision and skin grafting might be more efficient, but it required modern hospital facilities and was thus a treatment for the privileged, and was not yet available for the mass of natives.

Turning to "New Guinea mouth", Dr. Deland explained that it was simply a tropical ulcer in the mouth, arising from a preexisting Vincent's infection and suddenly spreading, following a lowering of local resistance due to ill feeding, respiratory infections, cold, hardship *et cetera*. Under such circumstances epidemics could arise. The process was one of acute gangrene commencing at a point on the gingival margin, almost always on the lower jaw, laterally. Affected teeth would loosen, and bone might be affected. Death from toxæmia was frequent in severe cases. Penicillin was highly efficacious in treatment, and had a life-saving effect in severe cases. Local treatment was simple; it consisted of applying lemon juice, whose acidity destroyed the Vincent's organism, and it contained a large amount of vitamin C. The patient must chew half a lemon twice a day. That treatment, with good feeding, caused mild cases to heal in a few days. On no account might excision of tissue or extraction of loose teeth be carried out. Arsenical preparations were of no use, and mercurial lotions were dangerous.

A. H. BALDWIN (New South Wales) said that outbreaks of tropical ulcer occurred in which Vincent's organism played no part. Indeed, in some outbreaks the staphylococcus was the predominant organism and he thought that Dr. Deland was giving too much prominence to Vincent's organism.

Dr. Deland, in reply, said that most authorities held that Vincent's infection was a clinical entity and that the words "tropical ulcer" should be reserved for it.

#### Scrub Typhus in North Queensland.

R. L. DOHERTY (Queensland) read a paper on scrub typhus in north Queensland. He said that 53 patients with scrub typhus had been studied in north Queensland between March, 1953, and November, 1954. Diagnosis was established by the isolation of *Rickettsia tsutsugamushi* in 45 cases and by the Weil-Felix test in eight. There were no deaths, and the clinical picture was milder than that

described in pre-antibiotic Queensland series. Twenty-four patients had a rash, appearing between the third and thirteenth days of illness; 19 had an eschar; seven had clinical signs of pulmonary involvement, and the history of one patient who developed bronchopneumonia was given. One patient developed cardiac failure; abnormal liver function test results were obtained from another. Serious mental and neurological changes were rare, in contrast to pre-antibiotic series. However, one patient had an episode of hyperpyrexia. Thirty-eight patients had lymphadenopathy, which was therefore the commonest abnormal finding on physical examination. Three children were included in the series; their illnesses were mild, but had recognizable features of scrub typhus.

Dr. Doherty went on to say that the clinical severity of the illness could be correlated with the virulence of the infecting strain (as determined by mouse passage) in certain respects (for example, the duration between the onset and the patient's admission to hospital). It was probable that the early use of antibiotics had prevented a more obvious relation between clinical severity and strain virulence.

In five cases a short exposure allowed the incubation period to be estimated at between eight and twelve days. The total duration of illness averaged 10.3 days; that of five patients who did not receive an effective antibiotic averaged 14.2 days.

Forty-five patients were treated with chloramphenicol, two with tetracycline, and one with chlortetracycline. The results were satisfactory; the average duration of fever after the first dose of antibiotic was 45.5 hours. No correlation could be demonstrated between speed of response and virulence of the infecting strain. Seven patients responded; the illness of five of them was due to virulent strains and that of two to mild strains. One of the latter group had vomited the capsules and might not have retained an adequate dose.

Nine patients relapsed after an early response to antibiotic treatment. Smadel and his team, working in Malaya, had demonstrated in human volunteers that relapse in scrub typhus was related to the stage at which treatment is commenced. Thus they recorded 62% relapses among 34 patients treated with chloramphenicol before the fourth day. Dr. Doherty then analysed the present series with those findings in view. One of the nine patients relapsed while the antibiotic was still being given; three had short relapses which settled without treatment; five received a second course of antibiotic. No patient relapsed whose treatment commenced after the ninth day of illness. Rickettsæmia was demonstrated during the relapse in three patients, including one who did not receive a second course.

Seventeen patients developed no *Proteus* OXK agglutinins, nine reached titres of 1 in 20 to 1 in 40, and 27 had titres of 1 in 80 or greater; thus only half had a titre that could be considered significant. Dr. Doherty said that the occurrence of "OXK-negative" cases had been recorded on a number of occasions; but there was little in the pre-antibiotic north Queensland literature to lead one to expect the high incidence found there. Age and race had apparently no bearing on the OXK titre; there was a suggestion that virulent strains gave significant titres more often than mild strains, but that observation did not reach statistical significance. The incidence of "OXK-negative" cases was significantly higher among patients with mild strain infections treated before the ninth day than among those treated after the ninth day, but that finding had to be accepted cautiously, as the numbers were small. Whatever the fundamental explanation of the "OXK-negative" cases, it was certain that the Weil-Felix test was not a satisfactory test for north Queensland typhus.

W. R. HORSFALL (Queensland) drew attention to a number of unpublished cases which had recently occurred in north Queensland. He said that the patients had been treated with chloramphenicol and all had recovered. He looked forward to the elaboration of a satisfactory rickettsial antigen for use in specific serological diagnosis.

E. H. DERRICK (Queensland) said that the serological test for scrub typhus not only failed in 50% of cases, but also gave false positive results. An example of that was the positive result which a *Proteus* infection of the urinary tract would produce.

#### The Transmission of Filariasis.

T. C. BACKHOUSE (New South Wales) discussed the transmission of filariasis with special reference to the Pacific region. After some remarks about nomenclature Dr. Backhouse referred to some published work tending to show that for nocturnal *Wuchereria bancrofti* in different parts of the world the vector was usually *Culex fatigans* where housing conditions were more or less urban. Where such conditions gave place to rural conditions, and in countries where *C. fatigans* was an imported insect, other species took on the role of vector. Such vectors were often anophelines, and in the Melanesian islands of the Pacific, except Fiji and New Caledonia, the genus *Anopheles* appeared to be the chief carrier. East of 170° east longitude, however, where *W. bancrofti* was non-periodic, it now had to adapt itself to the *Aedes scutellaris* subgroup of mosquitoes—a complex group which seemed to be in the process of speciation owing to various degrees of geographical separation. The recently disclosed fact that the filariasis of New Caledonia was non-periodic was surprising, since that island lay to the west of the non-periodic region and had no members of the accepted carrier species for that region. The whole question of the infectibility of mosquitoes by *W. bancrofti* required further investigation by parasitologists, entomologists and geneticists. The Pacific region was an ideal field for such studies.

R. H. BLACK (New South Wales), in opening the discussion, said that there had been a recent renewal of interest in the filarial diseases—as, for example, the work on loiasis in West Africa, and the work in the Pacific area sponsored by the South-Pacific Commission. Dr. Backhouse's early work in Rabaul was well known, and his interest in the subject of filariasis was evidenced by his recent experimental infection work at the School of Public Health and Tropical Medicine at Sydney. More work on filariasis could be expected as malariologists looked for fresh fields in insect-borne diseases when the problem of malaria had been completely solved. Had he been present, Dr. de Rook, of Netherlands New Guinea, would have been sure to ask for some explanation from Dr. Backhouse of the well-known patchy distribution of filariasis in New Guinea. Mosquitoes of the *Anopheles punctulatus* group were widespread. Dr. Black asked whether that uneven distribution of filariasis could be due to the local prevalence of a more efficient vector, perhaps *Mansonia* spp. or *Aedes kochi*.

C. M. DELAND (South Australia) said that he thought the patchy distribution of filariasis was due to association with mosquito breeding in pandanus palms.

Dr. Backhouse, in reply, said that he was inclined to reject Dr. Deland's view, and cited the case of Rabaul, where there was little or no pandanus, but appreciable though patchy filariasis.

#### Epidemiological Aspects of Classification and Histopathology of Leprosy.

W. S. DAVIDSON (Western Australia) showed a series of slides illustrating some epidemiological aspects of the classification and histopathology of leprosy. He said that variations in the characteristics of leprosy in different parts of the world probably resulted largely from differences in racial and environmental factors. It was possible that leprosy as seen in its early attacks on the population in Australia gave a different impression from what was seen in India and Africa, where it had been established for thousands of years.

Dr. Davidson said that the terms "tuberculoid" and "lepromatous" were easily differentiated, but the intermediate types caused difficulties, mainly because they were classified by those who were unwilling to concede that tuberculoid forms might undergo metamorphosis into

lepromatous forms. The Australian standards were simple: if clinically the lesion appeared resistant, if the lepromin reaction was positive, and if the smear count was low, the condition was regarded as tuberculoid; if the reverse features applied it was called lepromatous. It was possible that Montel's contention was correct—that the only differences were in the speed at which tuberculoid forms progressed to lepromatous forms.

Dr. Davidson showed slides that tended to confirm Freire's work in growing leprosy bacilli in culture with pleomorphic forms, which could be demonstrated also in lesions. Also, infection did not invariably occur in childhood, and an infective organism was excreted in the sweat even in tuberculoid forms.

E. W. GAULT (India) said that Dr. Davidson had performed a valuable service in drawing attention to the existence of leprosy in Australia, sometimes in areas where it might not be expected. Dr. Gault reminded those present that in testing the skin in cases of suspected leprosy it was imperative to shave the area first. That was necessary because the hairs with their attendant sensory apparatus could give erroneous results to the tests.

#### Malaria.

##### The Problems of Malaria in New Guinea.

CARL E. M. GUNTHER (New South Wales) read a paper on the problems of malaria in New Guinea. He said that malaria problems throughout the whole of New Guinea and its adjacent islands were identical. Most of the area was rough, mountainous and inaccessible; its population consisted of 3,000,000 natives, 20,000 Europeans and a few thousand Chinese. The natives were primitive, many of them still with a stone-age culture. Malaria was a heavy burden on them, and was the main factor in retarding their development. All four species of human malaria occurred in New Guinea. The important vectors were *Anopheles punctulatus* and *A. farauti*. Because of their breeding habits, larval control was impossible. Protection against adult mosquitoes was possible for Europeans and Chinese, but impossible for natives; drug prophylaxis was available to Europeans and Chinese, but only in a limited degree to natives. The only method of malaria control likely to be of practical value for general use was residual spraying with one of the chlorinated phenolic insecticides.

Dr. Gunther went on to say that Europeans, Chinese, and non-tolerant natives working in endemic areas needed screened dwellings, residual spraying and drug prophylaxis to protect them against malaria. The Chinese, since they were an indigenous, moderately tolerant group, presented few malaria problems. The Europeans were highly susceptible to malaria and had no tolerance; in spite of their needing every available protection against malaria, many of them were careless, and they suffered from much avoidable malaria. Antimalarial measures, if properly carried out, protected non-tolerant natives fairly well, and deaths from malaria did not occur. Malaria was slowly invading new areas, even at 6000 feet, but the impact was lessened by the care of the Administration medical services, and the natives should gradually develop a moderate tolerance. Tolerant natives employed in industry suffered from a negligible amount of malaria, and prophylactic drugs would not pay for their use; moreover, prolonged prophylaxis might destroy tolerance, with possibly disastrous consequences. Because it was non-toxic and cheap, because it was a true causal prophylactic against *Plasmodium falciparum*, and an excellent suppressant of *P. vivax*, even inhibiting its exoerythrocytic forms, and also because with its daily routine missed doses were not likely to matter so much, proguanil was the prophylactic of choice; 100 milligrammes per day was a sufficient dosage for adults. Other advantages were that it was excreted in the milk of nursing mothers in quantities sufficient to protect nurslings, that it was perhaps less likely to give rise to parasite resistance than pyrimethamine, and that it inhibited gamete and zygote development. If it could be organized, it was desirable to give light drug prophylaxis to malaria-tolerant native

women during pregnancy and lactation, in order to reduce maternal and infantile mortality and morbidity.

Dr. Gunther then said that the treatment of malarial fever in patients continuing to live in endemic areas should aim at clinical cure only. Tolerant natives needed only 300 milligrammes of proguanil daily for two days to achieve this, but non-tolerant patients needed 500 milligrammes of chloroquine three times on the first day and 250 milligrammes three times a day for the next three days, to prevent recurrences. Patients leaving malarious areas for good should have latent exoerythrocytic forms of *P. vivax* and *P. malariae* eliminated by a fourteen-day course of 10 milligrammes of primaquine diphosphate with 300 milligrammes of quinine bihydrochloride three times a day. Quinine, though generally in disfavour, was nevertheless a valuable drug in the treatment of malarial fever, and did not cause blackwater fever if it was used correctly.

Dr. Gunther finally said that the organization of residual spraying in the remote villages was likely to be a long and difficult task. It would involve selecting and training large numbers of native operators. If spraying could be extended to the whole country during the next five years, and if transmission of malaria could be broken within the succeeding five years, it would be a great achievement. A coverage of 0.5 gramme of dieldrin per square metre, applied to all dwellings in New Guinea every eight to twelve months, was probably the most economical method. Spraying had to be continuous, universal, and efficiently performed, in order to cut down the risk that insect resistance might develop. Once malaria had been substantially reduced, relaxation of spraying could let loose on a non-tolerant population a disastrous epidemic. Because of those risks, it was imperative that New Guinea should be assured, by Australia, of continuity of funds and freedom from interference in order to carry out its programme to proper completion.

#### Malaria in the Middle Wahgi Valley.

TERENCE E. T. SPENCER (Territory of New Guinea) presented a paper, by himself and D. MARGARET SPENCER, entitled "Malaria in the Middle Wahgi Valley Area of the New Guinea Highlands". It was stated that it had been known for some time that malaria was endemic in the New Guinea highlands; that had been shown by the survey carried out by Mr. S. H. Christian, who had proved that malaria was well established in the highlands before Europeans penetrated there. Although the present work was far from complete, the time was opportune to call attention to observations and conclusions following a year's study of the malaria problem in the Wahgi Valley. The Wahgi Valley had been discovered in 1933; it was about 60 miles long, and perhaps 15 miles across at its widest part; its floor was flat or gently undulating, and it was bounded by high mountain ranges; the Wahgi River ran throughout the length of the valley. The Middle Wahgi area included about 30 miles of the valley, with its floor at about 5000 feet above sea level, and with a native population of some 25,000.

Dr. Spencer explained that the natives of the area had had limited contact with Europeans for only twenty years; during the last few years the European population had been increasing, with, as a consequence, manifold impacts upon native customs and ways of living. Malaria was endemic, and there had been an epidemic at the end of the wet season, in April, May and June, 1954; in June, 1955, there was an increase in the incidence of malaria, but no real epidemic. Previously, Giblin had stated that topographical features influenced the distribution of malaria in the valley, some areas being free of the disease, and Black had concluded that in the upper Minj Valley malaria did not occur, since the steep slopes did not allow of mosquitoes' breeding. Dr. Spencer stated that *Plasmodium vivax*, *P. falciparum* and *P. malariae* all occurred in the area. He described the clinical features of the disease as it presented in hospital patients. During the wet season *vivax* and *falciparum* infections increased; as they declined, *malariae* infections took their place; then

as the dry season progressed all forms of infection decreased. Field surveys showed that high spleen rates existed in all age groups and in all parts of the area, but that natives living in the lower, flatter and poorly drained areas had spleen rates 20% to 30% higher than those living in the higher, steeper and well drained areas, that the spleen rate did not decrease greatly with age, that the average size of the enlarged spleens increased with age, and that, especially among the older women, females generally had a higher spleen rate than males. At the height of the wet-season epidemic, in communities living on the valley floor, the child parasite rate was 42% and the adult rate 19%; whereas towards the end of the dry season the child rate was 5% and the adult rate 8%.

Dr. Spencer then outlined the information so far obtained about anopheline mosquitoes in the Wahgi Valley. Four species occurred: *Anopheles punctulatus*, *A. farauti*, *A. bancroftii* and *A. annulipes*. *A. farauti* and *A. annulipes* were found throughout the area, at any time of year and in any kind of season, whereas *A. punctulatus* and *A. bancroftii* could at times hardly be found anywhere, and at other times were widespread; that was in keeping with their more restricted range of breeding conditions. All four species had been taken in daytime collections from native houses, although the majority taken were *A. farauti*. They were usually freshly engorged when taken. Outdoor trapping resulted in catches almost entirely of *A. farauti*, although admittedly at the time *A. punctulatus* had been generally scarce. All of the four species of anophelines had been found breeding close to houses, although *A. bancroftii* did not often favour such close association. In view of all the evidence, the authors suggested that the anophelines in the area led a semidomesticated existence, in close, but not obligatory, association with natives, their pigs and their houses.

Dr. Spencer then emphasized that *A. farauti* could be found all the year round, while *A. punctulatus* appeared only at favourable times, and that when there had been a severe epidemic of malaria in 1953, *A. punctulatus* was widely distributed; whereas during the very small increase in malaria in the wet season of 1954 that species had not been observed for many months. It was considered that *A. farauti*, although probably the vector of choice, was the less efficient vector, responsible for maintaining a low level of endemicity, while *A. punctulatus* was responsible for epidemic conditions whenever the presence of a high water table for some months favoured its breeding in large numbers.

In summing up, Dr. Spencer discussed the epidemiology of malaria in the Wahgi Valley in relation to the farming habits of the natives, and particularly in relation to their pig keeping. The upper slopes were better drained, thus offering less opportunities for mosquito breeding; and although the natives moved about the area a lot, the spleen rate of those who lived mainly on the slopes was lower than that of those who lived mainly on the flats. That was borne out by the higher spleen rates in females, and accorded with the fact that the women were the pig keepers and mostly slept in combined houses and pig stables on the flats. Dr. Spencer again emphasized the importance of the association between anopheline mosquitoes and houses and pig stables. He then assessed the degrees of endemicity in the Wahgi Valley. He said that the spleen rates placed some groups of natives in the "mesoendemic" category, and others in the "hyperendemic" category, but those categories could not be applied strictly in the circumstances; detailed analysis of the spleen rates pointed to a mixed type of epidemiology, with short periods of transmission at intervals, a low inoculation rate, and a persisting low endemic level, with local epidemics from time to time. In view of the way in which malaria still disturbed the natives, it appeared that although malaria was certainly present when the Europeans arrived, it had probably been introduced within recent times. Since development would inevitably lead to resettlement of the valley flats where malaria occurred most intensely, measures to control it would have to be applied.



### Malaria Control in the South-West Pacific Area.

ROBERT H. BLACK (New South Wales) discussed malaria control in the South-West Pacific Area. He said that for the purpose of his discussion the term "South-West Pacific Area" referred to the malarious islands of Melanesia, although it should be remembered that there were still foci of endemic malaria in the northern parts of Australia. From the time of the first European exploration and settlement in those island groups malaria had played a very prominent part in determining the outcome of those ventures. Amongst the native population malaria imposed its burden, not only by causing sickness and death, but also by its social and economic effects. Until recently there had been no effective rural malaria control in the South-West Pacific Area. The great Robert Koch, at the turn of the century, had attempted to eradicate malaria at Bogadjim by administering courses of quinine, but of course the result was a failure. Urban malaria, on the other hand, had been controlled on several occasions with a reasonable degree of success. Again, amongst allied troops in New Guinea during the second World War, malaria was effectively controlled as soon as the suppressive use of "Atebrin" was made a matter of strict army discipline, which it was impossible to imitate amongst a civilian population. In post-war years malaria control had been carried out more or less effectively in centres of European population mainly by means of larval control measures, together with the supplementary use of suppressive drugs. For a number of reasons it had not been practical to extend larval control measures to rural areas. The larval control measures had mainly been the use of DDT in oil on breeding sites at weekly intervals. That addition of DDT to oil used for larvicidal purposes had recently been condemned at malaria conferences, as the procedure favoured the development of resistance to DDT in anophelines.

Dr. Black went on to say that in those island groups of Melanesia there was a native population of over 3,000,000, and the great bulk of those people were in New Guinea. Probably about two-thirds of those people lived in malarious regions, and only about 2% of them were protected in any way against malaria. That contrasted with the state of affairs in East Asian and West Pacific countries, where 29% of 276,000,000 people living in malarious areas were protected against that disease in 1953.

Dr. Black then referred to the delay in adopting residual insecticide spraying as the method of malaria control in the South-West Pacific Area, a method which had been used with success in many of the malarious countries of the world. He said that the main vectors of malaria in that area belonged to the *punctulatus* group. There emerged in regard to New Guinea, as the result of Australian war-time observations, the opinion that members of the *punctulatus* group entered houses at night, fed and flew away. They did not remain in the houses. However, there were numerous reports of indoor resting at night.

Despite that last observation, it had until recently been considered that residual spraying would be an unsuitable method for malaria control in New Guinea. Work done in the last few years had considerably changed that opinion. Dr. Black said that he had made numerous observations of *Anopheles farauti*'s resting indoors in native houses in the daytime in widely separated areas in Papua-New Guinea. Metselaar and Van Thiel had made observations on the behaviour of the *punctulatus* group in relation to experimental houses. About one-sixth of the anophelines entering the house at night remained inside resting on the walls in the morning; the remainder were caught in the exit traps. One house was then sprayed with DDT and a second with dieldrin, and the third was left unsprayed for comparison. Observations were then continued with very encouraging results. Then a pilot project, with the use of DDT wettable powder as a residual spray for native houses, was commenced in the Lake Sentani area. The latest reports indicated that the transmission of malaria had practically ceased in the sprayed area.

In the New Hebrides, residual spraying of native houses with DDT had been used for some years in a restricted area, and the method appeared to have been effective. In Netherlands New Guinea a Malaria Control Service had been organized with adequate trained staff, the full support of the Administration, and funds readily available for its activities. Malaria was considered to be an urgent and vital problem. That territory had given the lead to the malarious countries of Melanesia.

Dr. Black finally said that the only possible effective method for the control of malaria in the South-West Pacific Area was the spraying of houses with a residual insecticide. The attack on malaria in those countries was thus at the commencement of a period during which great advances could be made towards the goal of eradication. The work should be carried out by an efficient national malaria control service, with the full support of the administration of the territory. The investment of funds in an effective malaria control programme was not an inexpensive one, but the dividends were rich and were spread over the spheres of health and social and economic benefits.

### Latent Malaria in Ex-Servicemen.

N. LEE (New South Wales) read a paper entitled "Latent Malaria in Ex-Servicemen". The paper referred to a series of patients seen during 1947; they had all been in malarious areas. Dr. Lee said that chronic malaria might or might not be associated with parasitaemia. He presented a classification which included "parasitic latency" in which there were suggestive symptoms but no parasitaemia, "clinical latency" in which there was parasitaemia but no symptoms, and "temperate", peculiar to latitudes similar to Sydney, presenting non-specific symptoms. The chief symptoms in this series were nervous, dyspeptic and fibrositic. Forty-three per centum of the patients were found to have parasites in their blood; it was necessary in many instances to make repeated examinations of films, and a falsely low figure was given by examining only one film.

### Discussion.

C. M. DELAND (South Australia) said that he thought that one should remind oneself that malaria was not one disease, but three separate diseases—malignant tertian, benign tertian and quartan. More should be known of the effects of the malignant tertian parasite on the organs of the growing child. He was of the opinion that capillary blockage occurred in cerebral vessels, and that that must show in the mental stature of an exposed race; indeed, he was satisfied that mental retardation in European children was far from infrequent in malarious areas. Referring to Dr. Lee's paper on latent malaria in ex-servicemen, Dr. Deland said that he had found that malignant tertian malaria often went with jaundice, and in quartan malaria a trace of blood in the urine was common. In benign tertian malaria herpes of the lips was almost diagnostic. Dr. Deland asked whether there was any real evidence of the development of DDT resistance in mosquitoes.

A. H. BALDWIN (New South Wales), commenting on Dr. Black's paper on malaria control, emphasized the importance of antimalarial work in the village. On the subject of development of resistance to the insecticides, he quoted evidence from Greece and elsewhere which could not be refuted. He said that he would have liked to know how long that resistance would take to breed out of a strain. Referring to cerebral changes after malaria, Professor Baldwin drew attention to the occurrence of that condition in air crews. He said that the symptoms were those of character change, in which the sufferer showed an inability to accept responsibility, but with that there was no decline in moral fibre. He thought that that was due to vascular damage.

C. E. M. GUNTHER (New South Wales) pointed out that as it was easy to confirm the presence of malaria by making blood films, to say that a patient had malaria on clinical grounds despite the absence of circulating parasites was not permissible; such cases must be given no

consideration in the evaluation of statistics. Moreover, to say that, because certain symptoms had disappeared after the exhibition of antimalarial drugs, those symptoms were symptoms of malaria was merely a *post hoc, propter hoc* approach which had no scientific value. Finally, even in the presence of active malaria, when certain symptoms which had no recognized place in the symptomatology of malaria cleared up after administration of antimalarial drugs, there was no scientific basis for claiming those symptoms as malarial, because after all there were other diseases, notably amebic hepatitis and rheumatoid arthritis, which responded to chloroquine or mepacrine. Nevertheless, if Knisely's observations on microaggregation of erythrocytes in knowlesi malaria in monkeys could be applied to falciparum malaria in man, as was highly probable, it was not unlikely that there would be a certain amount of permanent damage to the viscera, especially the brain, which could produce recognizable effects a long time later.

Commenting on Dr. T. E. T. Spencer and Dr. Margaret Spencer's paper on "Malaria in the Wahgi Valley", Dr. Gunther said that observations extending over only fifteen months were too short to form a good basis for conclusions as to epidemiology; moreover, much of the discussion in the paper was concerned with forcing the epidemiological evidence obtained in the Wahgi Valley into line with certain epidemiological conclusions which had been arrived at in Africa; that was impossible, since conditions in Africa were in many ways not comparable with those in the Wahgi Valley. In fact, conditions in the Wahgi Valley were not necessarily applicable to any other part of New Guinea, and the best that could be hoped for was to amass records for some years more and then, on the basis of those, to evaluate the epidemiology of malaria in the Wahgi Valley.

G. J. M. SAXBY (New South Wales) drew attention to a recent circular letter sent by the Department of Repatriation to 2163 ex-servicemen, inquiring from them whether they still had symptoms which might be ascribed to malaria. Of that number, 572 had replied and 560 stated that they had such symptoms. Examination of blood films from those men had up to the present given uniformly negative results.

### The Medical Consequences of Mass Population Movement.

HENRY SHANNON (Victoria) read a paper on the medical consequences of mass population movement. He said that the role of environment in the propagation of transmissible disease had been studied in great detail and was now well understood; its role in other disorders, such as those tentatively labelled "psychosomatic", was still far from clear. It was thought that the mass movement of a civilian population from one environment to another might provide vital statistics which would help to elucidate some of the problems involved. Those statistics were not at present available, but the administrative structure of medicine in Israel gave promise that in the future they might be. Although the country was no more than 8000 square miles in extent, it displayed every variety of subtropical climate. In the extreme north there was a small swampy malarious area, on the littoral there was a narrow very fertile strip, in the interior there were hills of varying fertility, and in the south there was a wide expanse of arid country capable of development only by irrigation.

Dr. Shannon went on to say that of the population of about 2,000,000 about 70% dwelt in the three great towns of Tel Aviv, Jerusalem and Haifa, and the balance was settled in various ways upon the land. Nutrition was maintained largely on a fish and vegetable diet, and there was evidence of much mild nutritional anaemia. Five-sixths of the population was of remote or recent European origin, and one-sixth (300,000) of widely diverse oriental extraction. The main transmissible diseases were diphtheria, infective hepatitis, amebic and bacillary dysentery, paratyphoid fever, scarlet fever, poliomyelitis and a moderate amount of malaria. Leishmaniasis had been practically extinguished by the use of DDT against the sandfly, and in consequence sandfly fever as well. Bilharzia, already present in the country, had been greatly reinforced by the arrival of 40,000 Yemenites, who were heavily infested. In spite of that, there was no sign of its spread, probably because of some snail resistance to infection. Malaria was almost confined to the area of the Hula Swamp in the north, but occasionally small outbreaks had occurred elsewhere.

## The Trade Exhibition.

THE TRADE EXHIBITION was housed in the Peter Nicol Russell School of Engineering and the Union Refectory and Buttery. The following is a short account of the several exhibits.

THE ABBOTT LABORATORIES PROPRIETARY, LIMITED, stand was given over entirely to the display of three recently introduced specialty products: "Erythrocin", "Covicone" and "Bejectal with Vit. C". The highlight feature was the new antibiotic, "Erythrocin" (erythromycin, Abbott), in three forms: the "Filmtab" (oral), the paediatric (oral) suspension and the latest research development, "Erythrocin Lactobionate", for parenteral injection. The importance of this new antibiotic in the treatment of coccal infections coupled with rapid raising of blood levels was given particular emphasis. A large "cut-out" transparent glove—"the invisible glove"—called attention to "Covicone", a new plasticized silicone vanishing cream, for use in contact dermatitis *et cetera*; a free sample tube was presented to all visitors to this display. "Bejectal (Improved) with Vit. C", in the new "Univial", completed the Abbott exhibit. This was the first introduction of this new type of vial to the medical profession of Australia. The "Univial" is a sterile vial with two compartments, each containing a portion of the ingredients, yet separating

incompatible components of the vitamin B complex. The contents of the two compartments may be mixed by simple pressure on the top rubber stop, which dislodges the rubber plug separating the two compartments; this gives a closed sterile technique and ensures stability of ingredients over a prolonged period of time.

ALA PROPRIETARY, LIMITED, exhibited a series of artificial limbs in metal and wood for above-knee and below-knee amputees, and made a special feature of the "physiological" and gear-segmented knee joints developed by the Habermann Orthopaedic Works of Munich and Frankfurt. Another feature of the Habermann limb which created much interest was the foot construction. This provides an accessible and simple device whereby patients, particularly women, may regulate the heel section to permit them to wear shoes with heels of various heights. In addition, the foot has inversion and eversion movements to accommodate the patient when walking on uneven surfaces. Limbs incorporating these features are now being made at the company's factory at Carlton, Sydney. A high degree of stability and security, coupled with a natural gait, was evidenced by patients using these limbs in a film which was shown during the exhibition. All above-knee exhibits were of the suction socket type, which entirely eliminates the wearing of braces and belts by

which conventional limbs are attached to the patient. The company now manufactures these sockets at its factory, thus making available to civilians for the first time in Australia the advantages of this prosthetic development. To indicate the field covered by the company the exhibit included a number of splints, braces and corsets incorporating some new ideas, an adjustable cervical collar made from transparent plastic of high tensile strength and arch supports made from the same material. Visitors to the stand were helped by the demonstrations of the company's principal technician, who was trained at the Habermann works.

ALLEN AND HANBURYS (AUSTRALASIA), LIMITED, displayed a representative range of drugs, instruments and hospital equipment. The most striking points of interest were the new model J operation table, in which all controls are operated from the head end of the table, so that any adjustment can be made without interruption of the surgical team, and the "Wendel" universal operation theatre light. The latter unit gives maximum light just where it is required by the surgeon; and its two independently adjustable light heads, each of which is equipped with heat and light filters, can be quickly and easily moved from the head of the table to well past the foot, the range being so great that it is unnecessary to move the table at all. Although finger-tip controlled, the two separate lights will not move once they have been placed in position. A display of world-famous Keeler ophthalmic instruments, for which Allen and Hanburys are sole Australian agents, had a prominent place. A complete diagnostic set, including "Pantoscope" and accessories, was shown together with the Keeler "Photometer".

A few of the Allen and Hanburys range of surgical instruments were combined in a display featuring representatives of various groups including forceps, scissors, needles and syringes.

In the pharmaceutical field, together with such well-known lines as "A.B. Insulins", "Nonad Tulle" and "Penicillin Nonad Tulle", were a number of new and interesting pharmaceutical products. Among these were "Sednine" (a palatable and effective cough suppressant containing the new antitussive "Pholcodine"), "Anxine" (designed for complete symptomatic treatment of anxiety states and containing dexamphetamine sulphate, cyclobarbitone and mephenesin), "Bidormal" (a dual barbiturate for controlled sedation over a full night of eight hours), "Scoline" (a muscle relaxant of ultra-short duration), "Guanimycin" (streptomycin for oral administration combined with sulphaguanidine) and "Helmezine" (a palatable antelmintic in elixir form containing piperazine citrate).

ANDREW'S LABORATORIES' stand, which consisted of a large central panel with two side wings, was a combination of the old and the new. Antique pharmaceutical jars and a floral display added to the dignified appearance of the stand. Pastel colours highlighted the enlarged photographs, graphs and other display material which were shown to advantage by fluorescent lighting. On the central wall of the stand Andrew's displayed preparations and literature beneath a panel depicting sixteen important drugs introduced by them over the last sixteen years. Prominence was given to Andrew's antimony sickness preparation, "Andramine", by the use of a large display unit in the centre of the stand, which featured a model aeroplane circling a globe, illustrating "Round the World with 'Andramine'". Other preparations represented the most recent advances in the field of medicine, both in Australia and overseas. Cortisone and hydrocortisone preparations, which have been manufactured locally during the past few years, together with combinations of these hormones with antibiotics, such as "Cortomycin", "Cortracin" and "Hydrocortomycin", were of special interest. Other preparations on display which have been introduced by Andrew's in the last few years were "Neotracin", a combination of two antibiotics for topical use, and "Androcort", the new adrenocorticotrophic hormone with prolonged action. Andrew's also featured the following preparations which have been released by them in the current year:

two hypotensive preparations, one containing the total alkaloids of *Rauwolfia serpentina*, "Rauwolfia", and one containing the pure alkaloid, "Reserpin"; a cation exchange resin for sodium withdrawal, "Desodex"; a mercury diuretic, "Oricur", for oral therapy without toxic effects; a combination of the extrinsic and intrinsic factors for pernicious anaemia, "Cycoplex".

The wings on either side of the stand were devoted to two well-known overseas manufacturers, Leo Pharmaceutical Products, of Denmark, and Brocades-Stheeman and Pharmacia, of Holland, which are represented in Australia by Andrew's Laboratories. Leo Pharmaceutical Products presented their new long-acting penicillin preparations, "Tardocillin" and "Tardocillin Universal", the new anaesthetic "Leostesin", the anticoagulant "Heparin", and the long-acting insulin, "Insulin Retard Leo (NPH)". Brocades-Stheeman and Pharmacia presented a display of their antispasmodic, "Cyclospasmol". The display demonstrated the excellent results which have also been achieved in clinical experiments by using "Cyclospasmol" as a remedy for gangrenous ulcers.

THE ANGLO-SWISS DRUG COMPANY exhibit was carried out with the Swiss national red and white colour scheme, having a background of red velvet drapes with a centrepiece giving prominence to their latest product, "Profundol". Side displays featured such products as "Doxephlin", "Endox", "Decavit", "Mephobarbital", "Methionine" and "Neuralgine". A new product was "Profundol". This is a quick-acting sedative and hypnotic, without untoward side or after effects, even in very high doses. It acts within five to twenty-five minutes, inducing natural, prolonged and profound sleep, and is eliminated after two or three hours. A second dose may be taken during the same night if necessary. "Profundol" is presented in clear, red, oblong capsules, which are made by the new rotary-die process, in which the capsules are formed, filled and sealed in the one operation, to ensure absolute dosimetric uniformity and stability. Packings are in 10's, 25's and 100's.

ANGUS AND ROBERTSON, LIMITED, of Sydney and Melbourne, presented a large number of new and important medical books. Of particular note amongst these was the new edition of Cecil and Loeb's "Textbook of Medicine", which is now available. It has been extensively revised, and many new articles appear. Of appeal to those in a group practice was "Good General Practice", which is a report of a survey by Stephen Taylor. Also displayed were the new 1955 edition of Goodman and Gilman's "Pharmacological Basis of Therapeutics", the first revised edition since the original published in 1943, and the "Australian Pharmaceutical Formulary, 1955", an important small volume for the general practitioner. Other new books and new editions on display included Wilfred Shaw's "Operative Gynaecology", Best and Taylor's "Physiological Basis of Medical Practice", W. Mayer Gross's "Clinical Psychiatry", F. J. Browne's "Antenatal and Postnatal Care", and a new Australian book, "Peripheral Vascular Disease", by two Melbourne authors, A. J. Barnett and J. R. E. Fraser.

Information was also available on new books expected to be published during the next six months. Of interest to surgeons will be the new edition of "Operative Surgery", edited by the late G. Grey Turner and Lambert Charles Rogers; Volume I is expected to be available in November and the second volume by June next year. The new 1953 editions of "Webster's Dictionary" and the eight-volume set of the "New Book of Knowledge" were exhibited, whilst an added attraction was the new "Australia: A Camera Study" by the Australian photographer, Frank Hurley.

AUDIPHONE COMPANY (N.S.W.) PROPRIETARY, LIMITED, distributors of Western Electric "Audivox" and "Amplivox" hearing aids and audiometers, had on display and available for demonstration the latest hearing aids and audiometers from Amplivox, Limited, of England, and The Bell Telephone Laboratories, of America. The outstanding feature



of the display was the Transistor—a tiny piece of metal, no bigger than a pea, which has revolutionized the electronics world since the war. What the Transistor has done for the hard-of-hearing can be seen in the latest "Amplivox" and Western Electric "All Transistor" aids. The "Amplivox" audiometer is a widely used hearing test instrument in Britain, and is used by leading otologists and hospitals in most parts of the world.

AUSTRALASIAN MEDICAL PUBLISHING COMPANY, LIMITED, exhibited scientific journals and reports, hospital reports and medical stationery. Copies of medical journals, including THE MEDICAL JOURNAL OF AUSTRALIA, *Australasian Annals of Medicine*, *Transactions of the Ophthalmological Society of Australia* and the *Australian Journal of Dermatology*, were on display alongside other scientific and educational journals, such as *Oceania*, *The Australian Journal of Science*, *The Australian Journal of Chemistry*, *The Australian Journal of Physiotherapy*, *The Forum of Education*, *Mankind*, *The Australasian Nurses' Journal* and *The Australian Journal of Philosophy*.

AUSTRAL ENGINEERING SUPPLIES PROPRIETARY, LIMITED, sole Australian representatives for the Cambridge Instrument Company, occupied stands 44 and 45. As early as 1907 the Cambridge Instrument Company, Limited, in cooperation with Professor Einthoven, pioneered the first electrocardiographs. Today, with a vast knowledge obtained through the years, and through combining with eminent physiologists engaged in cardiac functions in the larger London hospitals, the company is maintaining its activities in this ever-developing field. At the Congress stand Mr. S. L. Barron, of the parent company in England, who has a knowledge of over forty years in cardiology, demonstrated some of the latest equipment. The Cambridge Electrite Direct Writing Cardiograph is a compact instrument weighing less than thirty pounds and embodying the latest features in design; it is supplied with a heat-adjustable writing stylus, alternating current interference eliminator, pen-position control, rectilinear graph paper and a full range of accessories fitting neatly into compartments in the lid of the polished wooden cabinet. The instrument is capable of recording all 12 electrode positions and is supplied with five-way patient leads fitting in a plastic cover, in which the instrument is housed when not in use. The Cambridge Cardioscope is a mobile, explosion-proof unit designed to operate in conjunction with the Cambridge Electrite Cardiograph. It provides a continuous monitory record during an operation. The "Electrite" recorder can be instantaneously brought into operation at any desired time, giving a permanent record of any heart pulsations being observed on the cardioscope screen. The unit is fitted with a visual heart-rate indicator and is finding its way into large hospitals; where such operations as mitral valvulotomy and that for Fallot's tetralogy are performed it has proved a great asset to the anaesthetist. The Cambridge Three-Channel Direct Writing Recorder, in which is used a similar recording principle to that of the "Electrite" recorder, is designed to record three simultaneous records on the one chart. Such records may be chosen to give electrocardiograms, blood pressure records, jugular waves, respiratory curves, ballistocardiograms *et cetera*. Electronic amplifiers and power units used for the operation of the recorder are housed together with the recorder in a compact mobile rack. The Cambridge Four-Channel Photographic Recorder is provided with a variable two to one hundred millimetre per second camera speed, lighting control, time marker and frequency range up to 1000 cycles per second. This instrument, if desired, may replace the three-channel direct-writing recorder in the mobile rack. The complete outfit housing this recorder was described as a universal physiological recording outfit, performing all the duties of the three-channel recorder and in addition taking high and low frequency phonocardiograms. The Cambridge Pressure Transducer has stable calibration and extreme sensitivity. With this unit, records may be transmitted to the appropriate recorder, being either the three-channel direct writer or the four-channel photographic instrument.

The diaphragms incorporated are rapidly interchangeable giving ranges of pressure from one millimetre water gauge to 300 millimetres of mercury. In application this transducer may be arranged for blood-flow measurements, cardiac catheterization, respiratory flow measurements, phlebography and plethysphymography. The Cambridge Suitcase Portable Cardiograph is of the photographic type with a "string" galvanometer. It may be operated from the mains or can be supplied to work from a 12-volt accumulator. It is therefore particularly suitable for use where alternating current is not available. The Cambridge Skin Temperature Measuring Outfit is for the measurement of skin temperatures in such work as circulatory disorders and hypothermia. It is fitted with a six-point selector switch and is provided with six thermocouples of small diameter. The standard pattern of Cambridge Rocking Microtome was displayed together with an ultra-fine section-cutting instrument capable of cutting down to 0.0001 millimetre.

THE AUSTRALIAN PHARMACEUTICAL FORMULARY in its new edition and selected products from the Formulary were displayed. Various features of the new Australian Pharmaceutical Formulary are as follows: (i) monographs of some of the newer substances not in official volumes, such as the morphine antagonist amiphenazole and the barbiturate antagonist bemegride ( $\beta$ : $\beta$  methyl-ethyl glutarimide), known commercially as "Megimide"; (ii) therapeutic formulae numbering some 300, with an enlarged section on new oil-in-water and water-in-oil emulsion type ointment bases, and an eye drops section with special directions for dispensing; (iii) a new and comprehensive dose table of all British Pharmacopœia drugs, which is convenient to the medical practitioner, as he can see at a glance what the official drugs are when ordering Pensioner Benefit prescriptions; (iv) a therapeutic index which gives the physician a quick reminder of the preparations available in the Australian Pharmaceutical Formulary for the treatment of any complaint; (v) a poisons and antidote section, which has long been a feature and is extremely useful for any medical practitioner.

THE AUSTRALIAN STERILIZER COMPANY PROPRIETARY, LIMITED, demonstrated the two latest models of their "Sterimatic" pressure sterilizers, the Series W automatic washer-sterilizer and the little surgery sterilizer. The automatic machine was actually working, and it was interesting to see it stopping and starting at the various stages of the cycle without human aid. This machine is designed in such a way that the hospital staff need never touch an unsterile sputum mug, which makes it ideal for tuberculosis institutions. The same sterilizer also washes and sterilizes instruments and utensils, and sterilizes linen and rubber goods. If required, it can also sterilize bedpans. The surgery sterilizer, which was also on display, is designed as a completely portable pressure sterilizer and will operate off a power point. It is independent of plumbing connexions or hoses, and brings hospital sterilizing efficiency into the surgery, being capable of drying as well as sterilizing. The company claims that it operates at an approximate cost of four and a half pence per hour.

THE BARRÈRE DISTRIBUTION COMPANY included the following appliances in their exhibition: the "Neo-Barrère Hernia Bandage", a new type of hernia control without pads or springs for inguinal and scrotal hernia and suitable also for "post-operative wear"; the "Cary" Clinical Thermometer, a Swiss-made thermometer, which is unbreakable, has a clear dial reading like a watch and is made from stainless steel.

BAYER PHARMA PROPRIETARY, LIMITED, featured a selected range of their ethical preparations including "Campolon", "Prominal Compound", "Franol", "Decicain", "Zephiran" and "Monacrin". The "Venule", an automatic aspirating syringe, was also demonstrated.

BERLEI, LIMITED, arranged their exhibit to provide an opportunity for members of the profession to examine at close quarters the supports marketed by this company.

There were Camp supports for men, Camp-Berlei supports for women, Berlei maternity supports and the "identical breast form". Groups of photographs of the supports with captions were attached to the back of the exhibit. In front of the photographs was a bench on which samples of the supports were displayed. Interest was shown in the supports for low back pain in men. The new pre-natal "step-ins" aroused interest. There was general approval of the new weight-replacing "Identical Breast Form" for use in the rehabilitation of mastectomy patients. The exhibit was attractively coloured and aroused much interest.

BOOTS PURE DRUG COMPANY (AUSTRALIA) PROPRIETARY, LIMITED, featured the following products: "Viules", the new "Viule" injection technique, which consists basically of a single dose injection in a disposable container which is utilized with an unbreakable all-metal syringe; "Fenox", which is offered for the treatment of the common cold, hay fever, sinusitis and catarrh, its effect being achieved by low surface tension, viscosity similar to that of natural mucus isotonicity and adjustment of optimum pH; "White Heparin", which is available for intramuscular, intravenous or depot injections, and is stated to have advantages over ordinary heparin in that it has an extremely low level of pyrogenicity, complete absence of depressor substances, and freedom from painful reactions on injection; cortisone; insulin, including long-acting isophane and lente insulins as Insulin B.P., protamine zinc insulin and globin insulin; "Vagiflav", for the local treatment of vaginitis and associated leucorrhœa due to infection with *Trichomonas* and other pathogenic organisms; "Thiopentone", for intravenous anaesthesia; "Alimex", a smooth palatable preparation for ulcer therapy with the advantage of containing magnesium hydroxide in addition to aluminium hydroxide, which makes this preparation highly effective for use with elderly people.

BRITISH COD LIVER OILS (HULL AND GRIMSBY), LIMITED, were allotted stand number 88, on which they showed the following: (i) A scale model of a trawler, which had been brought from Hull on loan especially for the exhibition. The model represented the modern trawler, which costs about £200,000 (English currency); over 200 of these trawlers operate from Hull and Grimsby. (ii) A plaster cast of an Atlantic cod fish (*Gadus morrhua*), which also had been brought from Hull on loan for the exhibition. (iii) Samples of cod liver oil rendered from livers at sea on board the trawlers, and also samples of the refined oil in accordance with British Pharmacopœia specification. (iv) Samples of emulsions of cod liver oil, and of malt extract and cod liver oil, made in Australia from oil supplied by the company. These included all the well-known brands of emulsion and malt and oil. (v) Samples of "Seven Seas" bottled cod liver oil, which is supplied by the company to the Ministry of Food in England for free distribution to children, and which is also sold through chemists' shops in Great Britain. (vi) Samples of "Seven Seas" capsules. These are gelatine capsules containing cod liver oil, which provide an easy means of taking the oil. The company also had a silent film running on the stand showing trawling in the North Atlantic. The company's purpose in having the exhibit was to enliven the interest of the profession in this traditionally good product and to demonstrate the improvement made in quality, both medicinally and aesthetically, of modern cod liver oil. It was stressed to visitors that, though cod liver oil had a high vitamin A and vitamin D potency and was valuable for that reason, it was at least equally valuable for its unsaturated fatty acids and as a body builder. The company's Australian agents are G. P. Embelton and Company Proprietary, Limited, of Melbourne.

THE BRITISH DRUG HOUSES (AUSTRALIA PROPRIETARY), LIMITED, exhibited a comprehensive range of their medical products. "Anahæmin" was stated to be the complete answer for pernicious and other macrocytic anæmias; it is standardized to contain not less than 20 microgrammes of vitamin B<sub>12</sub> per millilitre. "Anahæmin" has been found

to be of value also in the treatment of *herpes zoster* and allergic dermatoses, and has a pronounced tonic effect. "Ancolan" is a new, long-acting, non-toxic antihistaminic for the treatment of motion sickness and allergic conditions. "Dehydrocholin B.D.H." comprised preparations of dehydrocholic acid, a powerful choleric of low toxicity, issued in the form of tablets and ampoules. "Entacyl" is an effective anthelmintic for the treatment of threadworm and roundworm infestations; it is issued in tablets each containing 300 milligrammes of piperazine adipate. "Entacyl" is non-toxic at therapeutic dose levels, has a pleasant taste, is stable in the presence of light and air and is odourless. Each "Mepilin" tablet and each teaspoonful (four millilitres) of "Mepilin Elixir" contains ethinyl œstradiol (0.01 milligramme) and methyl-testosterone (three milligrammes) for the treatment of geriatric conditions, menopausal disorders and the premenstrual syndrome. "Multivite-Six" contains vitamins A, B<sub>1</sub>, C and D<sub>3</sub>, nicotinamide and riboflavin. It is issued in the form of a chocolate-coated tablet, which is particularly acceptable by reason of its palatable taste and convenience in use. "Myanesin Elixir" and "Myanesin Tablets" are British Drug Houses preparations of mephenesin (British Pharmaceutical Codex), which was originally discovered in the British Drug Houses Research Laboratories. They are indicated for the relief of pain due to muscle spasm, particularly in such conditions as arthritis, fibrositis and rheumatic conditions, and also for the relief of states of anxiety and nervous tension. "Mycil" preparations containing chlorphenesin are issued in the form of powder and ointment for the treatment of fungal infections, particularly tinea. Pessaries are also available containing chlorphenesin and D.M.238, and are intended for the treatment of vaginal infections of fungal and trichomonal origin. "Scorbital" is the British Drug Houses formulation containing phenobarbitone (16 milligrammes—one-quarter of a grain) and ascorbic acid (100 milligrammes) in each tablet, for the administration of phenobarbitone without hangover effects so often associated with this substance. "Siccolum" is a dessicant paste containing titanium dioxide, zinc oxide, kaolin and chlorphenesin in a non-fatty base for the treatment of exudatory dermatoses.

THE BRITISH MEDICAL ASSOCIATION had on display many medical publications, including journals, monographs, books and pamphlets. Among the publications were specimen copies of the *British Medical Journal*, *Abstracts of World Medicine*, *Archives of Disease in Childhood*, *British Journal of Pharmacology and Chemotherapy* and *The Journal of Clinical Pathology*. Monographs included those on "The Incidence and Cause of Blindness", "Radiant Energy" and "Ocular Vertical Deviations".

BRITISH PHARMACEUTICALS PROPRIETARY, LIMITED, displayed a range of ethicals from British manufacturers for whom they are Australian representatives. The bulk of the exhibit was given over to the preparations of Organon Laboratories, Limited. One feature was "Cortrophin 'Z'", a long-acting preparation of ACTH with a suspension of zinc phosphate. "Pernæmon Forte", a highly concentrated and painless liver extract, was associated with "Bifactor" tablets, effective oral treatment for pernicious anæmia. Included in the exhibit were preparations of Martindale (Savory and Moore) and some interesting new lines from Rybar Laboratories. The "Astron 2000", an ingenious and attractive heater fan from Germany, was also on display.

BRITISH SCHERING, LIMITED, in their exhibit prominently featured that company's sedative preparation, "Oblivon", and a large, illuminated model of an "Oblivon" capsule, in the corresponding shade of sea-blue, attracted much attention. The various indications for "Oblivon" were illustrated by means of a series of wall panels, and included a realistic picture of a young woman, sedated with "Oblivon", stoically facing the "horrors" of the dentist's drill. "Neo-Mercazole", the new antithyroid substance recently accepted as a National Health (Pharmaceutical Benefits)

item, was also featured. A comprehensive range of British Schering hormone products included the following preparations: "Orasecron" tablets for the control of secondary amenorrhoea and use as a test for pregnancy; "Aquaviron", an aqueous preparation of testoviron for injection with prolonged action; "Androgeston", a compound tablet preparation of ethisterone and methyl-testosterone for the control of menorrhagias; "Ethidol" sedative compound tablets, especially designed for the treatment of menopausal patients.

BOTH EQUIPMENT, LIMITED, of Sydney and Adelaide, and MEDICAL EQUIPMENT SERVICES, LIMITED, of Melbourne, occupied stand Buttery D, where they exhibited a comprehensive range of the following electro-medical and X-ray apparatus: Both direct writing electrocardiograph, Both direct writing electroencephalograph, short-wave therapy apparatus, X-ray screening units, X-ray diagnostic units, audiometers, nerve stimulators, shock therapy apparatus, incubators for premature infants.

BURROUGHS WELLCOME AND COMPANY (AUSTRALIA), LIMITED, exhibited a range of ethical pharmaceutical products, several of which had resulted from investigations in the Wellcome Research Laboratories. Of particular interest are the following products: "Aerosporin" polymyxin B sulphate, a new antibiotic, highly bactericidal against a wide variety of Gram-negative organisms and especially against *Pseudomonas pyocyanea*. In addition to the antibiotic itself, which is administered parenterally in systemic infections, two other preparations of "Aerosporin" were exhibited—"Aerosporin" otic solution, rapidly effective in the eradication of ear infections, and "Neosporin" antibiotic ointment, in which polymyxin is combined with bacitracin and neomycin to provide bactericidal action against virtually all bacteria found topically. "Marzine" cyclizine hydrochloride is a new compound which has given good results in the prevention of nausea and vomiting of pregnancy, in the prevention or relief of travel sickness of all types, and in the reduction of vertigo whenever it is a complicating factor of other conditions. Digoxin "B.W. & Co." is widely used as a cardiac glycoside in digitalis therapy. "Perazil" chlorcyclizine hydrochloride and "Actidil" triprolidine hydrochloride are two antihistaminic compounds developed in the Wellcome Research Laboratories which meet the requirements of almost all patients exhibiting allergic phenomena. "Tricoloid" tricyclamol chloride is a new type of anticholinergic preparation for the control of gastric secretion and hypermotility in cases of peptic ulcer; "Tricoloid" compound contains phenobarbitone in addition for those cases in which a degree of sedation is indicated.

"BUTTERWORTHS" has been synonymous with standard legal major works and text-books for a century and a half, and in the past quarter-century with such standard medical reference works as "The British Encyclopædia of Medical Practice" and "British Surgical Practice". These, together with a wide range of text-books, with the emphasis on the modern, were on display at Butterworth's stand, number 56. The pre-release information on their new work, "Operative Surgery", aroused interest, as the new British work which will deal with surgery in pictures in eight volumes, covering the whole field for the general practitioner and specialist.

CALMIC, of Crewe and London, had as the main feature of their exhibit the "Ferromyn" display. "Ferromyn" (ferrous succinate) is described as the latest British development towards ideal oral iron therapy. Maximum absorption and utilization are achieved with the minimum dosage of ferrous salt. A dose of 150 milligrammes of "Ferromyn" (tablets or elixir) provides 35 milligrammes of bivalent iron, permitting rapid hæmoglobin increase with minimum gastric disturbance. Another preparation featured was "Cimlac Gauze" (compound aminacrine tulle), a non-adherent, non-greasy wound dressing for varicose ulcers, burns and wounds; it is stated to be suit-

able for the bacterial control of Gram-positive and Gram-negative wound pathogens which have become penicillin and sulphonamide resistant. Also displayed was "Calped", an antipruritic fungicide with strong inhibitive action over a large variety of fungi. "Calped" encourages desquamation of infected skin and allows direct contact with invading fungi. It is prepared as cream or powder.

CIBA made a feature of "Serpasil" on their stand. This interesting and increasingly important alkaloid was first isolated, pharmacologically tested and marketed by CIBA, Limited, of Basle, Switzerland. Thus, because of gravimetric instead of biological assay, the crystalline and therapeutically active principle of rauwolfia could be used with the advantage that its potency did not vary. This has also made possible the production of an injectable form of the drug. "Serpasil" is an antihypertensive, bradycrotic and uniquely tranquillizing drug. The tranquillizing property cannot be narcotic even when high dosage is employed, as the patient always responds to external stimuli, a property which is in strong contrast to that of the barbiturates. Also, when it is used orally, the antihypertensive effect is slow in its inception, and generally pressures do not fall below a certain level, no matter what dosage is given. Consequently "Serpasil" is safe. More recently in dermatology and pædiatrics, "Serpasil" has been found to be of use, mainly because of its tranquillizing effect. "Serpasil" is prepared in tablets of 0.1 milligramme and 0.25 milligramme, and in ampoules of 1.0 milligramme. A few days prior to the Congress a four-milligramme scored tablet was introduced to Australia for use in psychiatric and neurological problems. Part of the CIBA display dealt with this new four-milligramme tablet, which has been readily accepted by mental institutions overseas.

CLEVELAND S. LENNON, LIMITED, presented a range of ethical products on stand 83.

COMMONWEALTH DENTAL SUPPLY COMPANY, PROPRIETARY, LIMITED, featured "Xylocaine" local anæsthetic. Emphasis was laid on the swiftness, sureness and safety of this local anæsthetic for medical or dental use. It is manufactured by A. B. Astra, Sodertälje, Sweden, and is accepted by the American Medical Association.

THE COMMONWEALTH INDUSTRIAL GASES, LIMITED, was represented at the Trade Exhibition by the medical section of its subsidiary, C.I.G. (New South Wales), Proprietary, Limited. Because it has associated itself with all phases of oxygen therapy in Australia, C.I.G. has formed a natural clearing-house for the dissemination of authoritative information on mechanical aspects of this branch of physical medicine. A display of the latest apparatus for the economical and efficient administration of oxygen to the patient included the "Melco" all-aluminium oxygen tent with hermetically sealed compressor, and the new C.I.G. ice-cooled oxygen tent. Perhaps the most useful piece of oxygen therapy apparatus exhibited was the "Polymask", a light plastic oro-nasal type of mask, which provides a constant concentration of oxygen to the patient at minimal flows. Through the courtesy of the Trustees of the Christchurch Museum, New Zealand, C.I.G. were able to display the actual oxygen assault apparatus used by Sir Edmund Hillary in the conquest of Mount Everest. A life-size model completely equipped for high-altitude climbing was of particular interest. A working model of the C.I.G. central oxygen system, which is now an accepted method of oxygen supply in hospitals throughout the world, afforded hospital executives an opportunity of seeing how efficiently such a system operates. For the first time in Australia, and as distributors for Australasia, C.I.G. displayed the "Insul Cot". The design and engineering were carried out by Both Equipment, Limited, to provide complete isolation, and, utilizing fresh, filtered air, the "Insul Cot" protects the tiny infant from air-borne pathogens. The air-oxygen intake of the "Insul Cot" allows the incoming oxygen to be mixed with a predetermined amount of air before it is warmed, humidified and circulated. Already



over 70 of these units have been ordered by the Victorian Hospitals and Charities Commission. Apparatus for the administration of nitrous oxide and oxygen in anaesthesia and analgesia included the recently developed Boyles Model "H", the "Centanaest" and the New Improved C.I.G. Type A5 apparatus. Useful in the treatment of poliomyelitis, the Beaver respirator (Mark II) was specially flown from London for the display. A feature of the Beaver respirator is its compactness, and the fact that it can be manually operated in case of power failure. Many other important pieces of equipment used in conjunction with gas and oxygen anaesthetic apparatus were also shown by C.I.G.

COMMONWEALTH SERUM LABORATORIES displayed on their stand a range of biological products of various types, including those of blood fractionation.

COX, FINDLAYSON AND COMPANY, LIMITED, as agents for Upjohn of England, Limited, and the Upjohn Company, Kalamazoo, United States of America, had a colourful stand staffed by Upjohn representatives from all States, and supported by attractive literature relating to Upjohn products. These have not hitherto been available to the medical profession in Australia. The greater part of this exhibit was taken up in featuring the latest advances in the synthetic adrenal steroids field, in which the Upjohn Company are pioneers. Most prominent was the "Cortef" (brand of hydrocortisone) series, which included the topical anti-inflammatory ointment. "Cortef" for intravenous injection was also of interest to surgeons and anaesthetists. The latest development from the Upjohn Medical Division was "Delta-Cortef" (prednisolone or delta-1-hydrocortisone). It is stated that this, the newest of the synthetic adrenal steroids, like cortisone and hydrocortisone, is a potent therapeutic agent influencing the biochemical behaviour of most, if not all, tissues of the body. In contrast to the earlier steroids, however, much lower doses of "Delta-Cortef" are required to obtain a therapeutic effect, and as a result considerably fewer side effects are observed. Amongst the antibiotics, the Upjohn Company presented "Myciguent" (neomycin) ointment, erythromycin, and "Acti-Dione" brand of cyclohexamide, an Upjohn speciality of interest to pathologists for the inhibiting of yeasts and moulds in cultures. "Pamine" bromide tablets and elixir for the treatment of peptic ulcers and allied disorders were also introduced. One of the Company's American products shown was "Orthoxine" for the treatment of bronchial asthma and the control of nocturnal cramps.

THE CROOKES LABORATORIES, LIMITED, showed the following products on their stand (number 8). "Cortico-Depot" is a long-acting preparation of ACTH. It is available in rubber-capped vials of five millilitres, each millilitre of solution containing 20 international units. Crookes's ACTH is also available as the dry substance in vials of 10, 25 and 50 international units. "Pertenal" is for the relief of hypertension, and has a uniform and reliable action. It is free from any tendency to cause depression or melancholia, and it does not produce constipation. "Pertenal" consists of the purified alkaloids of veratrum with mannitol, a safe vasodilator, and a small dose of phenobarbitone. "Seconesin" embodies a new principle in sedatives; it consists of the muscle relaxant, mephenesin, with a small dose of secobarbital. It produces not only a mental but also a physical relaxation, so that adequate relief of tension, excitement or apprehension is achieved without drowsiness. "Dermasulf" overcomes the usual disadvantages of sulphur for use in dermatology. It is a colourless, odourless, aqueous solution of polythionates, and in this form is readily utilized by the tissues so that the risk of sulphur dermatitis is negligible. "Dermasulf" is readily acceptable to the patient, even for use on the face or scalp. Preparations for the treatment of rheumatic complaints are "Auro-Calcium", an injectable gold preparation (P.B.A.), "Mephosol", an effective analgesic, and "Anabalm", a non-greasy rubefacient cream. Recently introduced is "Collotone", a pleasantly flavoured restorative and stimulant tonic. Two old-established preparations exhibited were "Lacto-Calamine", which is widely used in

dermatology, and "Neo-Ferrum", a well-tolerated iron preparation which is miscible with milk and does not stain the teeth.

DENYER BROTHERS exhibited the following items: "ASCO" catgut and suture material, insulin, liver extracts, "Athripin", Denyer operating tables, "Hanger" (Eng.) artificial limbs, surgical appliances and splints, surgical instruments, Leslies (Eng.) plasters.

THE DRUG HOUSES OF AUSTRALIA presented a comprehensive display of the products of D.H.A. Medical Division, Lederle Laboratories, D.H.A. Surgical Department and Laboratory Equipment, and Woolwich-Elliott, Proprietary, Limited. A section devoted to the activities of the Flying Doctor Service occasioned much comment and interest.

The D.H.A. Medical Division featured a range of medical products, including: "Soluvac" fluids for intravenous use; "Senokot", the new natural-rhythm laxative; the "Bitone" range; "Procollin" syringes; "Angesil", an effective analgesic; "Viadol", the synthetic combination of vitamins A and D; and the new antagonist to the respiratory-depressant action of morphine, D.H.A. 245. This substance is now the subject of a monograph in the Australian Pharmaceutical Formulary (1955).

The Lederle section emphasized the advantages of "Achromycin", the broad-spectrum antibiotic with low incidence of side-effects. The new application of "Varidase", a non-surgical debrider, by intramuscular injection, was featured, as also was "Diamox", the non-mercurial diuretic for oral use. Its use in glaucoma and *petit mal* was of particular interest. "Perihemin Capsules" had created interest as a result of the reading of papers on the oral treatment of anemias.

A most comprehensive range of surgical apparatus was displayed and created much interest. The English "Brown Burger" cystoscope was featured, and instruments for thoracic and paediatric surgery were displayed. The "Ultra Asept" syringe, a product of Henke, created considerable interest, as the parts of these syringes are interchangeable, and the problem of the broken syringe barrel has now been solved by the introduction of these syringes. The "Bircher Hyfreacator" was demonstrated. The newly introduced instruments of continental manufacture aroused much interest, particularly the range of needle-holders, amongst eye surgeons.

New anaesthetic equipment was displayed. Of perhaps the greatest attraction was the showing of the "Acci-Bator". The wide range of usefulness of this product in ambulance, aeroplane or hospital was indicated.

The photographic exhibit of cameras and accessories for medical research, including "Zeiss Pentacon", "Proktica" and "Praktina" 35-millimetre, aroused great interest, as did the display of "Medichromes", which covered a wide range of surgery and pathological slides. Also included in the laboratory equipment section were photo-electric instruments manufactured by Dr. B. Lange, of Berlin. These included a "Medico" colorimeter with calibrated scales for bilirubin, haemoglobin and protein content, a flame photometer for sodium and potassium determination, a "Universal" double photocell colorimeter, a "Beaker" colorimeter and a "Nephthelometer". Latest microscopes from *Officine Galileo*, Milan, included a research microscope, single and binocular microscopes and a stereoscopic microscope.

The Woolwich-Elliott Chemical Company, Proprietary, Limited, displayed its current anaesthetic ether and ethyl chloride packs, amyl nitrite, ether soaps, collodions, *et cetera*. It is worthy of note that the company has produced these chemicals, from Australian raw materials, and to a consistently high standard of purity, for forty years this year.

EAGLE SURGICAL COMPANY, PROPRIETARY, LIMITED, showed a comprehensive display of the manufactures of the company. Duralumin artificial limbs and the "Sierra" American automatic harness-controlled upper limb prosthesis are

now being produced for the first time in Australia. The cosmetic glove and hand also created interest. A complete range of colostomy and ileostomy appliances was also shown. Plastic cervical and hand splints were appreciated on account of their lightness and their waterproof qualities. The company was fortunately able to present a new, fully illustrated handbook of surgical appliances. A full range of elastic hosiery was displayed, including two-way stretch hosiery in cotton and nylon. The new "Aeromesh" nylon net lightweight stocking was well received; the opinion was expressed that the stockings would serve the dual purpose of giving adequate support for many vascular conditions, and at the same time be cosmetically acceptable to the patients. A comprehensive display of surgical belts and corsets included a support in the new lightweight nylon elastic group, varieties of which will be available in the near future. Canadian type duralumin elbow crutches were also shown. The whole exhibit combined to show a large range of Australian manufactured appliances, comparing favourably with those produced overseas.

CARLO ERBA, S.P.A., MILAN, ITALY (Stand 87A) was founded in 1853, and has factories in Italy, the United States of America, Argentina, Brazil, Chile, Cuba, Spain, Mexico, Peru, with sole agents in 94 countries. The main factory in Italy is one of the largest industrial enterprises in pharmaceuticals and chemicals. "The Carlo Erba Institute for Therapeutic Research" attached to this factory carries on continuous activity in the chemical, pharmacological, microbiological, biochemical and clinical fields, and their new plant is engaged in extracting and synthesizing the most modern and most delicate pharmaceutical products. The many specialties shown at the Trade Exhibition are known and appreciated all over the world.

F. H. FAULDING AND COMPANY, LIMITED, had three stands, on which they showed Faulding products, Pfizer products and Roche products. The Faulding products included the following: penicillin injections, in convenient disposable packs permitting aspiration to see if a vein is entered prior to injection and allowing the needle to be rinsed after injection (available as a pharmaceutical benefit); "Pentone" and "Sodium Sedal", products in the hypnotic and sedative field; "Proxyl", a pleasantly flavoured piperazine elixir for eliminating both round and thread worms; "Reserpal", a hypotensive agent stated to be free from serious side effects; "Pectolin", a cough syrup incorporating "Pholcodine" in a palatable soothing vehicle; "Ascotin", a synergistic combination of aspirin, phenacetin and codeine.

The following were among the Pfizer products exhibited: "Terramycin", a broad spectrum antibiotic with a wide coverage and minimum side effects, presented in convenient dosage forms; "Tetracycline", tetracycline, the nucleus of the broad spectrum antibiotics, presented in dosage forms similar to "Terramycin"; "Cortril", a range of hydrocortisone preparations for systemic and local treatment of *status asthmaticus*, Addison's disease, rheumatoid arthritis and allergic and inflammatory conditions; "Terra-Cortril", a combination of "Terramycin" and "Cortril", available in ointment and ophthalmic suspension; vitamin preparations in capsules, providing valuable combinations for nutritional purposes and in disease.

The following Roche products were displayed: "Gantrisin", the Roche sulphonamide, a potent antibacterial agent indicated in a wide range of infective conditions and free from unpleasant side reactions; "Ronicol", a well tolerated, effective peripheral vasodilator, which can safely be taken over prolonged periods; "Dromoran", a powerful analgesic, more potent and longer acting than morphine, but causing less frequent side reactions, and effective when given orally and by injection; "Asterol", a potent antifungal agent; "Romilar", a well tolerated, non-narcotic, non-sedative cough suppressant.

FISONS CHEMICALS (PROPRIETARY), LIMITED, associated with BENDER LABORATORIES, LIMITED, and GENATOSAN, LIMITED, were showing some of the products of each of these old-established houses.

"Benger" products included the new form of iron for intramuscular injection, "Imferon", which aroused considerable interest. "Dextraven" was well displayed. The fact that this new narrow-fraction dextran contains a majority of effective molecular weight dextran was illustrated by an illuminated fish tank containing different sized goldfish, under the heading: "The little ones get away . . ." The other "Benger" products, "Ferrivenin", "Hyalase", "Casydrol Oral" and "Auralgicin", were also displayed, and literature on these was available.

Genatosan, Limited, was represented solely but effectively by their new range of "Dermatologicals" just introduced in the Commonwealth. These are: "Acudex Lotion", for acute eczemas; "Zithol Cream", for subacute lesions (and "Zithol Green" where secondary infection exists); and "Pixcyl Cream" (synthetic tar in polyethylene glycol base) for chronic conditions. These products were introduced some eighteen months ago in the United Kingdom, where they have been welcomed.

GAMMA LABORATORIES occupied Stands 21 and 21A, as agents for the following: *Laboratoire Nativelle*, Paris; *Laboratoires Clin-Byla*, Paris; *Istituto Chemioterapico Italiano*, Milan; *Laboratoires Renard*, Paris; Gewo Pharmaceutical Products, Wohlen, Switzerland. The ethical preparations exhibited included the following: "Asieryl Nativelle" cachets; "Digitaline Nativelle" tablets and ampoules; "Jodhema Nativelle" tablets and ampoules; "Natisedine Nativelle" tablets; "Ouabaine Arnaud" ampoules and tablets (for intramuscular and intravenous use); "Quinacardine Nativelle" tablets and ampoules; "Biocidan Clin" tablets, ophthalmic solution, and powder (with penicillin); "Ortoclin Clin" dragees; "Paderyl" dragees and syrup; "Detraïne Clin" ointment; "Pneumogéine Renard" drops and suppositories; "Benzofosfan" syrup and ampoules; "Neuronitrile B<sub>2</sub>" ampoules; "Picoscoterone" ampoules; "Vicisin" drops and ampoules; "Formoguanidine" syrup; "Carboyoghaurth" cachets; "Sinestrol" tablets, ointment and ampoules; GT50 "Gewo" forms A and B ampoules (5 × 5 cubic centimetres), the new physiologically acting preparation for the treatment of rheumatoid arthritis; "Calas" ampoules (5 × 10 cubic centimetres), an injectable solution providing for the simultaneous administration of calcium and vitamin C; "Mycasan" ointment, powder and tincture, for the treatment of mycosis of the foot and hand; "Dipasic" tablets, for the treatment of tuberculosis.

GEIGY PHARMACEUTICALS (Division of Geigy Australasia, Proprietary, Limited) had a stand constructed from a model and details supplied by J. R. Geigy S.A., Basle, Switzerland. Predominantly geometrical in design, this stand consisted of two rear walls painted white, on which were displayed photographic enlargements of scenes from the Geigy Biological Laboratories. The stand was fronted on two sides with yellow-faced, black-backed rhomboids, each of which contained a strip-lighted recess in which was a diagrammatic illustration of the use of a Geigy pharmaceutical specialty. The following products were so displayed: "Butazolidin", for the treatment of rheumatic diseases; "Trombolytan" ("Tromexan"), anticoagulant; "Eurax", for the treatment of pruritus; "Synopen", a well-tolerated antihistaminic; "Parpanit", for use in Parkinsonism; and "Taaryl", a non-toxic cough suppressant. The stand was fitted with a grille-type ceiling painted black, on which were distributed coloured squares, and had an orange coloured floor; the whole was illuminated by spotlights.

The GENERAL MILK COMPANY'S display was solely concerned with the use of "Carnation Unsweetened Evaporated Milk" for infant feeding. The company is relatively new to Australia, the milk being processed in Victoria and distributed throughout all Australian States. Natural

feeding of infants is undeniably the first choice of both baby and mother; but when this is not possible or is inadvisable, the claim is made that from the viewpoints of nutrition, digestibility, uniformity, availability and comparative economy, "Carnation Evaporated Milk" is a suitable form of milk for the artificially fed baby. The following features were accentuated in this display. (i) Protein modification. This is purely a physical change in protein structure brought about by heat treatment during the processing of the milk, resulting in a fine curd when the milk is peptonized and rendering digestion more complete in the gastro-intestinal tract. Display samples illustrated the fine, soft, granular curd of evaporated milk as compared with the firm, tough curd of raw milk. (ii) Fat homogenization. There is evidence of a greater tolerance for the fat content of cow's milk if it is thoroughly emulsified or homogenized. The fat particles are much reduced in size, so that a greater surface area is exposed to the action of fat-splitting enzymes. The improved digestibility of evaporated milk has been demonstrated clinically. Prepared milk smears (stained with Sudan III) illustrated under the microscope the practically uniform and much decreased size of fat globules from evaporated milk as compared with the varying particle size of fat globules from raw milk. Photographs of premature triplets born in Melbourne and Sydney reared or being reared on "Carnation" milk, were on display, and it was pointed out that the company has always made a special study of the feeding of babies of a multiple birth, the most famous being the Dionne quintuplets.

Publications available, free of charge, to members of Congress and to students included "Modern Infant Feeding with Unsweetened Evaporated Milk" and formula cards which give a complete guide for a twelve months' feeding schedule, together with other useful data.

Two films were screened at specified times in the Peter Nicol Russell Theatre. One film demonstrated the terminal heat method of preparing a milk formula for a day's feeding and the second gave an historical survey with clinical observations of infant feeding over the period of the last hundred years.

GENERAL X-RAY COMPANY PROPRIETARY, LIMITED, of Melbourne, occupied stand 76.

GLAXO LABORATORIES (AUSTRALIA) PROPRIETARY, LIMITED, displayed on their stand the new treatment for hyperacidity—"Styrasorb". The display for this product demonstrated diagrammatically the mode of action of this substance. A full range of the company's penicillin and streptomycin products was also shown, to coincide with the commencement of production of streptomycin at the new antibiotic plant at Port Fairy, Victoria. These products included "Crystalline Penicillin G", "Mylipen Suspension" (aqueous suspension of procaine penicillin G), "Seclopen" and "Estopen", together with streptomycin sulphate and "Strepolin" (stabilized solution of streptomycin sulphate). A special feature was also made of the synergistic effect to be achieved by the combined use of penicillin and streptomycin. Such products as "Crystamycin", "Seclomycin", "Estomycin" and "Mystrepton Ointment" were associated with this section. The company's range of vaccines was also adequately shown. Particular emphasis was placed on "Triple Antigen Glaxo" for combined diphtheria-pertussis-tetanus immunization. Other vaccines included diphtheria pertussis combined prophylactic, pertussis suspended vaccine, diphtheria prophylactic P.T.A.P., cold dissolved vaccine and tetanus vaccine. Vitamin  $B_{12}$ , which was isolated by Dr. E. Lester Smith in the Glaxo Laboratories in 1948, occupied a prominent position on the stand. A full range of the company's vitamin  $B_{12}$  products was on display, including "Cytamen 1000" (1000 microgrammes of vitamin  $B_{12}$  per cubic centimetre for injection), "Cytacoon Liquid" and tablets for oral administration. On display also was the company's range of radiological products, including "Dionosil Oily" and "Dionosil Aqueous", the rapidly absorbed medium for bronchography.

G.P. PROPRIETARY, LIMITED, occupied stand number 16. The main display showed the company's tonic range, "B.C.M.", "B.C.M. Plus", "B.C.M. with Phenobarbitone", "Hepasol Compound", "Hepasol Compound with Pentobarbital Sodium" and "Hepasol Compound without Strychnine", and their vitamin products for oral administration, "Multi-B", "Multi-B Plus", "Multi-B with Phenobarbitone" and "Multi-B Forte". Displayed on side panels were the new antacids "Aciban" and "Aciban Compound", and the recent releases "Tussinol" and "Tussinol with Pholcodine". The tablet range on display included the analgesics "Codiphen" and "Codiphen Plus" and the anti-depressant "Phetadex". "Retinol Ointment" and "Retinol Suppositories" were also displayed.

GRAHAME BOOK COMPANY PROPRIETARY, LIMITED occupied stand 53 with a display of medical books from their stock.

RUDOLF GUNZ AND COMPANY PROPRIETARY, LIMITED, had a display showing the history of the manufacture of syringes, and also the procedure in the manufacture of "Chance" fully interchangeable syringes, which are made in England. These are produced not only in all glass, but also in Luer-Lok type. The feature of full interchangeability allows the sale of spare barrels and plungers. Also displayed were "Ico" syringes made by Societa Italiana Ico, Bologna. These are of all glass construction, as well as Luer-Lok, and are graduated by the vitrified method, which is guaranteed indelible under any type of sterilization. The range comprises one to 100 cubic centimetres, and in addition the syringes are available with graduations for insulin and tuberculin. Pistons and barrels have identification numbers to facilitate sterilization. Other syringes shown on the stand were "Record" syringes of the "Surqual" and "Ico" "Faro" types, which can be sterilized at temperatures up to 200° C. These also have indelible graduation markings. Societa Italiana Ico also supplies a new type of needle—"Ico K51". These needles are packed in tins as well as in individual plastic containers, are made of the finest quality steel and are available for "Record" or Luer mounts. The new German-made quick-acting local anæsthetic agent "Xylestesin" was displayed; this is available in bottles of 50 cubic centimetres, as well as in cartridges of 1.8 cubic centimetres' capacity. Quick-absorbing strips, "Strolls", for operative work were displayed; these are indicated when it is essential to use a non-fluffing product.

HANNAM'S PROPRIETARY, LIMITED, presented a display relating to their role as manufacturers of autoclaves, sterilizers, laboratory apparatus, operating tables, hospital furniture and food conveyers, and as specialists in operating theatre lighting and in maintenance of equipment.

HORLICKS PROPRIETARY, LIMITED, took the opportunity of introducing to the medical profession two new products in their pharmaceutical range which are additional to the now well-known "Nulacin". These products were "Becantyl", a new type of cough specific available in syrup form, and "Adrenoxyl", an original product for the control of capillary hæmorrhage, which is available in both ampoule and tablet form. These three products are the forerunners of a range of ethical pharmaceuticals which Horlicks intends to introduce to medical practitioners. The Horlicks stand was centred around three panels in the back wall, each displaying some feature of "Adrenoxyl", "Nulacin" and "Becantyl". A system of daylighting and ultraviolet light illumination with fluorescent paints worked on a time interval gave an effective impression of some aspect of each product's indications.

ILFORD (AUSTRALIA) PROPRIETARY, LIMITED, exhibited, on panel X-ray viewing boxes, radiographs demonstrating procedures in general radiography and special investigations, including magnification, angiocardiology and tomography. In addition, inspection of a wide range of over 200 lantern slides of radiographs of pathological interest was possible on the Ilford multiple lantern slide viewing box, which was demonstrated for the first time in Australia. Accessories, such as X-ray cassettes, intensifying screens, processing hangers, *et cetera*, were also shown.



IMPERIAL CHEMICAL INDUSTRIES OF AUSTRALIA AND NEW ZEALAND, LIMITED, exhibited on stand 27 the well-known products "Sulphamezathine", "Trilene", "Mysoline" and "Cetavlon". A particular feature was the introduction of the following three new products to the medical profession: (i) "Hibitane", a powerful bactericide, which is now available in Australia in the form of an antiseptic cream. This cream is recommended for use in prevention of cross infection during dressings or swabbing in surgical or obstetric wards. (ii) "Sulmezil" tablets and suspension. This preparation contains a mixture of "Sulphamezathine" and "Dibencil" benzathine penicillin, so that each individual tablet or each fluid drachm of suspension contains 0.5 gramme of "Sulphamezathine" and 150,000 units of "Dibencil" benzathine penicillin. (iii) "Dibencil" oral suspension. This new product contains 300,000 units of "Dibencil" benzathine penicillin in each large teaspoonful (five cubic centimetres). The preparation is stable at ordinary room temperatures, and the full potency is therefore assured over extended periods of use.

JOHNSON AND JOHNSON PROPRIETARY, LIMITED, had as the main feature of their display a section showing, by the use of specimen jar, sample and photography, the processes involved in the manufacture of surgical sutures. It showed the viscera of healthy sheep, the clean unsplit casing, the split casing, the bleached casing, then chromicized ribbons, unpolished catgut strands both plain and chromicized, and polished catgut strands, plain and chromicized. The display also showed the gut wound ready for drying and sterilizing, the sterility check, the digestion test and the strength test chart. Various sections of the plant and equipment used were shown in photographs arranged in sequence on the rear wall. In this way the complete process was clearly shown. The balance of the display comprised Johnson and Johnson's range of ready-made surgical dressings and other specialty items such as "Gamophen Surgical Soap", "Bio-Sorb Glove Powder", and needles and sutures *et cetera*.

KNOLL LABORATORIES showed as their special feature "Benol" (vitamin B<sub>12</sub>) in various strengths (1500, 1000, 100 and 20 microgrammes), and "Benol Drops" for oral use. They also showed "Serfia", which is made from selected alkaloids of *Rauwolfia serpentina*; it is said to reduce hypertension in seven to ten days, to have no side effects, and to be effective in the treatment of the premenstrual syndrome and menopausal upsets. Other products shown included the following: "Pasan", "Calcipas", "Isotiny", cortisone, hydrocortisone, sodium salicylate (five, 7.5 and 10 grains), theobromine sodium salicylate, "Rheumavit", "Pentonal Compound", "Multisulpha", "Multisulphettes", "Sulphalyl", "Nollipyrin" and "Nollipyrin Forte". Amongst the Knoll vitamin preparations were shown "Atamin Forte" (100,000 international units), "Aneurine" (tablets of 100 milligrammes), "Betamin Complex" and "Betamin Complex Forte" (both tablets and injections), and "Vitacal" (both tablets and powder). Amongst the Knoll substances for injection, apart from vitamin preparations, were pethidine, adrenaline, atropine, ephedrine, folic acid, hyoscine, "Isotiny", morphine, normal saline, papaverine, "CEstramine", "Scopolamin", procaine, "Progeste", stilbestrol, "Testine" and triple-distilled water.

KODAK (AUSTRALASIA) PROPRIETARY, LIMITED, planned their exhibit to show the close relationship between medicine and the various applications of photography as a recording medium. An introductory niche dramatically emphasized this close relationship by means of a full-sized radiograph of a woman. The radiography section featured Kodak "Blue" brand X-ray film, Kodak X-ray chemicals and Kodak X-ray processing equipment. There was a model X-ray processing room, and this was supported by a large number of overseas and local examples of modern radiography. Also of interest were examples of experimental work with isotope sources, and of new techniques, one of which was a method of taking both photographic and radiographic images on the one motion picture film. Clinical photography came next, and here were exhibited

more than 30 eight-inch by 10-inch "Ektachrome" and "Kodachrome" colour transparencies. Some of these exhibits represented case histories in sequences, including a series of six which showed the improvement brought about by a  $\beta$ -ray treatment in a case of carcinoma. Also in the colour field were examples of miniature colour work ("Kodachrome"), including a fine range of clinical records of the eye. Clinical photography in regular black and white was not overlooked, and there were numerous instructive examples from both British and Australian hospitals. Hasselblad and Kodak "Retina" camera equipment suitable for clinical photography was demonstrated. Reference was also made to the Cine-Kodak Special Model II, the standard equipment for motion picture clinical work. In the third place was exhibited the "Recordak" for the microfilming of hospital documents, and lastly mention was made of the importance of photography, not only as a personal hobby on its own account, but also for the increased value and interest which it could bring to other hobbies.

L. KUTTNER PROPRIETARY, LIMITED, presented a range of ethical products on their stand. These included the following: "Trachiform"; "Sal Urem"; "Neuramidol", an ephedrine-calcium benzyl phthalate "A.P.C." preparation; "Ung. Rheumasan", a salicylate preparation for percutaneous administration; "Tricedin C.C.C.", an analgesic containing codein, calcium and calciferol; "Neasthonal", "Klimax" and "Juvogen". The following sedatives were exhibited: "Hyperbatal", a barbiturate preparation, fully recoverable in the urine in twenty-four hours and described as stable, quick-acting, powerful and non-cumulative; "Lebrojon", iodized and bromized lecithin suitable for prolonged use; "Somnopyrin", a non-barbiturate preparation for induction of painless sleep. Visitors to the stand were presented with a brochure covering the past fifty years of the company's activities as well as brief details of the products marketed.

CHARLES McDONALD PROPRIETARY, LIMITED, exhibited a wide range of their Australian-made ethical specialties. The spearhead of their display was "Cemalonal", the sedation tablet in four strengths; each strength is indicated by a distinctive pastel shade. "Glysinal", a pleasantly flavoured tablet of aluminium dihydroxy aminoacetate with added glycine, for use in the treatment of hyperacidity and peptic ulcer, and "Kalopectins" Numbers 1 and 2 were given prominence. "Kalopectin" Number 1, a combination of colloidal kaolin and apple pectin gel suitably flavoured, is intended for the management of simple diarrhoeas, while "Kalopectin" Number 2, containing 0.5 gramme of phthalylsulphacetamide per teaspoonful of the Number 1 preparation, is described as an ideal combination for the treatment of gastro-intestinal infections. "Parentosol Vitamin B<sub>12</sub>" was on display in ampoules and in the special Charles McDonald 10 cubic centimetres economy vial. The component parts of this special vial, which is a feature of the Charles McDonald injectable range, were also exhibited. A new ethical product of *Rauwolfia serpentina*, "Hypothal", was introduced for the treatment of mild and labile hypertension. The desirable feature of reasonable balance between hypotension and sedation with "Hypothal" was of interest. Also exhibited were specimens from Queensland of the Australian plant *Alstonia constricta*, on which the company is presently carrying out research regarding the reserpine content. Other products shown were "Hæmofort", a ferrous iron tablet with both enteric and sugar coating, for the treatment of hypochromic anemias and nutritional deficiencies, "Novotone" reconstructive tonic with or without strychnine, "Tab. Novotone Co.", "Sulphaco", "Sulphaco-Mitis" and "Neuplex". Injectable products displayed included "Cemalonal", "Diurophylin", "Neuplex", "Pethanal", "Pyriderm", "Protolox", "Synthanal" and "Vibafort". The latest addition to the injection range, "Pyriderm Compound", a combination of 50 milligrammes each of vitamin B and vitamin B<sub>6</sub> per cubic centimetre, was introduced in the 10 cubic centimetre economy vial.

MAY AND BAKER (AUSTRALIA) PROPRIETARY, LIMITED, displayed an interesting range of their preparations including the following. "Largactil" brand chlorpromazine hydrochloride affects the functional activities of the central and autonomic nervous systems. It depresses the vomiting mechanism; it enhances the effects of central depressant drugs such as hypnotics, anaesthetics and analgesics; and it has a powerful peripheral antiadrenaline action. It is used in anaesthesia, and in psychiatry for its calming effect. "Ansolsen" brand pentolinium tartrate, a ganglion-blocking agent, is indicated in the treatment of selected cases of hypertension. "Anthisan" brand mepyrizine maleate and "Phenergan" brand promethazine hydrochloride are antihistaminics with differing periods of action; the activity of "Anthisan" persists for four to six hours and side effects are mild; with the more powerful "Phenergan" a duration of action of from sixteen to eighteen hours may be anticipated. "Avomine" brand promethazine-8-chlorotheophyllinate, originally introduced as a remedy for travel sickness, has also been found of value in the prevention and treatment of nausea and vomiting due to a variety of causes. "Sulphatriad" brand compound sulphonamide tablets of 0.50 gramme strength, for adults, each contain sulphathiazole 0.185 gramme, sulphadiazine 0.185 gramme and sulphamerazine 0.13 gramme; for administration to children, "Sulphatriad" Flavoured is available in tablets of 0.25 gramme. "Thiazole" brand phthalylsulphathiazole is a gut-active sulphonamide which is more effective than sulphaguanidine or even succinylsulphathiazole; owing to its high activity, dosage is small, and it is also highly effective even in the presence of watery diarrhoea. "Brulidine" brand dibromopropamide isethionate, which is issued in the form of 0.15% cream, is particularly active against Gram-positive pathogens as well as many of the commonly occurring Gram-negative organisms, while it also has antifungal properties. It is of low toxicity and is unlikely to provoke sensitization reactions. "Diaginol" brand sodium acetrizate is a water-soluble X-ray contrast medium which has a higher iodine content than diodone or iodoxyl.

MEDICAL RESEARCH PROPRIETARY, LIMITED, exhibited various products, including "Ferrous Aminoates (Organic Iron)" synthesized by chemists of Medical Research. They are presented in three forms and are described as being easily tolerated, readily absorbed and non-toxic to children. "Methnine" (dl-methionine) and "Becholine" (choline chloride), also shown, are two lipotropic agents used for the prevention of liver damage and repair after injury or disease, accelerating convalescence. "Salazopyrin" (a combination of salicylic acid and sulphapyridine) is stated to be of great value in cases of ulcerative colitis and associated arthritis; it is a product of Pharmacia Limited, Sweden. "Methyl Diol" and "Geristerol" for the treatment of gout and "Amino B Fort" (the whole B complex) valuable in therapy of vitamin B deficiency were of particular interest. Among the products of original research shown on behalf of Riker Laboratories, Limited, were "Veriloid", the biologically standardized Veratrum preparation of unvarying potency, and "Rauwiloid", the biologically tested desirable fraction of the alkaloids of *Rauwolfia serpentina*, and its combinations "Rauwiloid" + "Veriloid" and "Rauwiloid" + hexamethonium for the treatment of more severe grades of hypertension. "Theodrox", which is stated to be the only oral aminophylline preparation which ensures full response, was also on display. Two interesting new products were calcium disodium "Versenate", a specific for lead and other heavy metal poisoning, and "Rauwilidine", a new approach to mood elevation.

MERCK AND COMPANY, INCORPORATED, featured "Merck Milestones of Chemical Progress". The most important were as follows: 1946, cortisone first synthesized by Merck chemists (it was offered commercially in 1949 under the trade mark "Cortone"); 1950, hydrocortisone synthesized by Merck chemists (it was offered in 1952 under the trade mark "Hydrocortone"). Other Merck introductions were as follows: 1934, ascorbic acid; 1936, thiamine hydrochloride; 1938, riboflavin, niacin, niacinamide; 1939,

pyridoxine hydrochloride; 1940, calcium pantothenate; 1946, streptomycin; 1948, vitamin B<sub>12</sub>; 1954, fludrocortone, metacortandracin, metacortandralone.

MULLARD-AUSTRALIA PROPRIETARY, LIMITED, associates of Mullard, Limited, England, and specialists in all types of electron tubes, occupied stand B in the X-ray section of the exhibition. Their display centred round a photographic depiction of the characteristics of their wide range of rotating anode X-ray tubes. This large picture surmounted a display unit on which a comprehensive range of rotating anode inserts was placed. The complete range of shock-proof casings which enclose the X-ray insert tubes was set out on a lower section of the stand, so placed that the appearance, construction and ratings of each tube shield unit were readily apparent. A rather unique feature of this display was the manner in which the rotating anode tubes were started up and handed to members while still spinning and continued to run for some fifteen minutes after being returned to their position on the stand. A range of newly introduced thoriated filament high-voltage rectifiers for X-ray equipment was shown, along with other X-ray accessories, including a Potter-Bucky diaphragm. Other interests were catered for in the display of electrochemical laboratory instruments for conductivity measurement and potentiometric titrations, and a selection of special valves including Geiger counter tubes.

NESTLÉ'S FOOD SPECIALITIES (AUSTRALIA), LIMITED, which has been manufacturing baby foods and other preparations for many years, had an attractive display of its various products. The infant foods "Vi-Lactogen" and "Lactogen", well known to the medical profession for their digestibility because of the very fine soft curd formation and fat disintegration (due to homogenization) were shown. "Nestogen", a "half-cream" spray-dried milk for use in cases of fatty dyspepsia and other conditions in which a reduced fat intake is indicated, was also displayed. The milk in this special food is homogenized to ensure the same ease of digestion as is found in "Lactogen". "Ideal" evaporated and homogenized milk, successfully used for many years in the dietary of babies suffering from allergic conditions, was presented in two packs, 12 ounces and six ounces. The new six-ounce size was welcomed by paediatricians. While dried milks like "Lactogen" are recognized as orthodox for infant feeding in Australia, "Ideal" milk can be readily used for this purpose if desired, the whole milk dilution being one part of "Ideal" milk to one and a quarter parts of water. This can then be modified in the same way as ordinary milk. Two products comparatively new in this country which attracted attention were "Arobon" and "Nestargel". "Arobon" is used in the treatment of diarrhoea in infants and adults. It is an adsorbent of vegetable origin, and is effective in producing a formed stool in twenty-four to thirty-six hours in most cases. "Nestargel" is an antiemetic thickening powder with a high gelling property; indications for its use are habitual vomiting, rumination and persistent vomiting associated with pertussis. "Milo", "Malted Milk" and "Sunshine" full-cream dried milk were also shown.

NICHOLAS PROPRIETARY, LIMITED, featured recent developments. The major displays were devoted to the use of "Daptazole" in the treatment of intractable pain, and to "Palpac", a mixed protein food. The exhibit also included the display of a complete range of Nicholas Proprietary, Limited, ethical products and those of G. D. Searle and Company, Limited.

THE PARKE-DAVIS EXHIBIT incorporated eight illuminated coloured transparencies depicting the well-known products "Benadryl", "Carbrital" and "Chloromycetin", together with four recently introduced preparations, "Ambodryl", "Ergodryl", "Mercloran" and "Paladac". "Ambodryl" (bromodiphenhydramine hydrochloride) is a new antihistaminic agent of high potency and with low incidence of side effects; it is supplied in gelatin "Kapseals" containing 25 milligrammes in bottles of 100. "Ergodryl" is the classical combination for the relief of migraine and vascular headaches; each capsule contains ergotamine tartrate,

one milligramme, caffeine citrate, 100 milligrammes, and diphenhydramine hydrochloride, 25 milligrammes; it is supplied in bottles of 10 and 100. "Mercloran" is a mercurial diuretic for oral administration; it is presented in the form of tablets, each containing 18.3 milligrammes of chloromercuri methoxy propylurea, equivalent to 10 milligrammes of mercury, and packed in bottles of 25 and 100 tablets. "Paladac" is a palatable orange-flavoured multi-vitamin liquid formula readily accepted by children and adults; it contains nine vitamins (A, B and C, plus B complex factors including B<sub>12</sub>) and is supplied in bottles of three fluid ounces.

PHARMEDICA PROPRIETARY, LIMITED, exhibited the following range of pharmaceutical preparations including several new products. "Meticorten" (Schering Corporation, United States of America) (metacortandracin) is a new highly potent cortisone-like steroid, more potent than cortisone but causing significantly less sodium retention and potassium excretion. "Parenzyme" (National Drug Company, Philadelphia) is specially purified crystalline trypsin prepared for intramuscular administration; it is stated to produce rapid and often dramatic reduction in acute local inflammation in those disease entities characterized by inflammatory reactions, and to have been found especially valuable in the management of phlebitis, ocular inflammation and traumatic wounds. "B-PAS" (A. Wander, Limited, London and Berne) (4 benzoyl orthoxy-p-aminobenzoic acid) represents a new development in PAS therapy; by virtue of its slow elimination "B-PAS" calcium salt ensures effective sustained blood levels. "Dimethylane" (National Drug Company, Philadelphia) (2,2-diisopropyl-4-methanol-1,3 dioxolane) is a new versatile compound producing a selective block of interneural transmission; it is indicated in the management of the numerous nervous disorders arising from stress. "Ambigen" (Pharmedica Proprietary, Limited, Kingsgrove) is a balanced preparation of natural type androgenic and oestrogenic steroids for the restoration of endocrine equilibrium at the menopause. "Biopar" (Armour Laboratories, England) (crystalline vitamin B<sub>12</sub> with intrinsic factor Armour) represents a major advance in pernicious anaemia treatment; it provides an effective oral replacement for injectable vitamin B<sub>12</sub>. "Tryptar" (Armour Laboratories, United States of America) (purified crystalline trypsin Armour) is a new product, stated to be dramatically effective in the physiological débridement of surfaces covered with necrotic tissue and pyogenic membranes without injury to normal tissue. "Novesine" (A. Wander, Berne) is a new topical anaesthetic which is stated to combine a high therapeutic efficacy with perfect tissue tolerance. "Natrini" (National Drug Company, Philadelphia) is the original cation exchange resin of the carboxylic type for the removal of sodium in cases of congestive heart failure, hypertension and cirrhosis.

PHILIPS ELECTRICAL INDUSTRIES PROPRIETARY, LIMITED (X-RAY DIVISION), displayed a series of exhibits. The Philips Super DLX was designed to cater for the needs of the radiologist who demands not only a high-powered unit, but also effortless operation. The following are some of the applications for which it offers advantages: (a) High-power, short-exposure radiography; gastro-intestinal examinations *et cetera* with optimum tube load; spot films *et cetera*. (b) Short-exposure chest radiography with optimum tube load. (c) Fluoroscopy with completely independent controls for kilovoltage and milliamperage. (d) Tomography with remote control. (e) Kymography with special time circuit for long exposures (eight per second). The Philips Medio DLX offers the two factors of importance in radiography: (a) high tension, (b) milliamperage value. These are obtained simply. Both the kilovolt and milliamperage adjustments are effected directly by turning the proper knobs, without calculating or consulting graphs or tables. The Philips DXI portable X-ray unit is described as the portable X-ray unit with the extra power; it is readily erected in three simple stages, is easily transported in tropic-proof, light-weight carrying case, and can be connected to any alternating current mains supply. The Philips vertical fluoroscope embodies the features demanded from units of this type with certain advantages.

Occupying a minimum of floor space, extremely stable and of very sturdy construction, the unit possesses great flexibility of movement and application. It consists of (a) the stand (20 inches by 25 inches by 72 inches), (b) the fluorescent screen (14 inches by 11 inches), (c) the double-slot diaphragm, (d) the generator, and (e) the control (11 inches by 7 inches). The Philips Faciloscope tilting table has been expressly designed to meet the needs of the private radiologist or the small hospital, particularly where initial outlay is an important factor to be considered. It will also have a place in the larger department where a second table is required. Basically, the Faciloscope consists of a rigid sheet metal framework with a low absorption "Bakelite" top, pivoted on a table pedestal support. A flat Bucky diaphragm can be fitted, to traverse the full length of the table top. The table is counterbalanced and can be tilted with a minimum of effort. The Philips vertical Bucky stand consists of a heavy steel base (suitably shaped to provide room for the patient's feet), carrying two vertical steel columns pressed together at the top. The columns carry the Bucky carriage, which is counterweighted and suspended by means of two roller chains. The Philips vertical Bucky stand can be used with advantage for orthopaedic, antenatal and gastro-intestinal work. The Philips "Biosol" (250-watt pedestal model) is a newly developed apparatus of practical and pleasant design which can be employed by general practitioners, by dermatologists and by the patients themselves. It is equipped with the improved Philips 250-watt fused quartz burner. The Philips "Cardiotrace" has the following features in the new model: (a) freedom from interference, (b) direct-writing inking system, (c) ferrous dust-proofing, (d) standardization, (e) positive earth indicator.

POTTER AND BIRKS PROPRIETARY, LIMITED, featured agency products manufactured locally. Products of Grosvenor Laboratories Proprietary, Limited, of Sydney, included "Pyropax", a sterile antibiotic, antiseptic cream for the treatment of burns and other conditions involving damage to skin tissues; "Thorexlin", an antibiotic, anaesthetic tablet for the treatment and alleviation of mouth and throat irritations; "Proteopax", an antibacterial, proteolytic digestant for the treatment of infected open wounds to remove sloughs, blood clots, and wound debris; "Ulosan", an antibiotic, anaesthetic preparation for the relief of dyspeptic, dental and non-specific oral ulcers; "Obesin", an effective therapeutic adjuvant to the dietary management of obesity; "Collax", a hydrophilic colloid for treatment of disorders of the lower part of the bowel. Schenley Laboratories, of Indiana, United States of America, were represented by "Nucrose", an emulsion for caloric supplementation in underweight patients; "Trephep", an expectorant, decongestive, antihistaminic cough syrup; and "Sombulex", a barbituric acid derivative for the treatment of nervous insomnia. From Plough Incorporated, of Tennessee, United States of America, came "Aqueous Mistol", a nasal decongestant with antihistaminic properties for the treatment of hay fever, vasomotor rhinitis and other allergic conditions; and from Pharmaceutische Fabrik "Roter", of Holland, was included "Roter", a tablet based on classical bismuth therapy with special treatment of the bismuth salt, for the simple oral treatment of gastric and duodenal ulcers.

QUALITAS PROPRIETARY, LIMITED, showed the following equipment on their stand: "Cooligraph-A", "Coolinaxos-75", "Novo-Cutor", "Sanophon", "Melag", "Galvanofar", "Faradicator", "Sauna" face bather, "Cawo" screens and other X-ray accessories, large illuminator displaying "Cawo" test films. Particular interest was shown in the "Novo-Cutor" electrosurgical unit, "Sauna" face bather, "Sanophon" ultrasonic unit, "Cawo" X-ray intensifying screens and light-weight X-ray protective aprons and gloves.

RECKITT AND COLMAN (AUSTRALIA), LIMITED, displayed a series of their pharmaceutical products. "Codis" presents a familiar grouping of analgesic drugs: aspirin, phenacetin, codeine phosphate, with an important advantage—the



"aspirin" in "Codis" is rendered soluble, as in "Disprin". When placed in water, "Codis" tablets disperse rapidly to form a solution of calcium aspirin and codeine phosphate with finely suspended phenacetin. "Codis" is recommended for all those conditions for which *Tabella Codeina Composita* (B.P.) would normally be prescribed, with the added advantages of more rapid relief and less likelihood of gastric irritation due to aspirin intolerance. "Disprin" tablets are soluble, substantially neutral aspirin tablets in stable form. "Disprin" tablets readily react in water to form a palatable solution of calcium aspirin. Since "Disprin" is soluble, it is rapidly absorbed and consequently speedy in its clinical effect. Moreover, by virtue of its solubility "Disprin" is unlikely to irritate the stomach. "Dettol" is an antiseptic with a high germicidal efficiency. It is rapidly bactericidal against a wide range of pathogenic microorganisms, including *Streptococcus pyogenes* and *Staphylococcus aureus*. Its efficiency is well maintained in the presence of blood and pus. It is pleasant to use, is an excellent deodorant and is a useful detergent. "Dettol" is compatible with ordinary soaps. Surgical "Dettol" has been specially formulated for pre-operative skin disinfection. It is in alcoholic solution ready for immediate application to the skin. It incorporates a colouring compound to define the area treated, and dries rapidly, leaving the skin in a non-slippery condition. It is available in two colours, orange and blue. "Dettol" obstetric cream contains 30% "Dettol" and is a suitable antiseptic for use in obstetrics. "Dettol" ointment contains the active bactericidal constituent of "Dettol" in an emollient base. Recommended for the treatment of abrasions, minor burns, scalds and ulcers, it is also beneficial in maternity cases for sore and cracked nipples.

SCANDINAVIAN TRADING COMPANY PROPRIETARY, LIMITED, occupied stand 55. They are sole agents in Australia for A. B. C. V. Heljestränd, Eskilstuna, Sweden, manufacturers of surgical instruments made of stainless steel, for Avesta Jernverks AB, Avesta, Sweden, manufacturers of Alwall's artificial kidney made of stainless steel, and for AB Instrumenta, Lund, Sweden, manufacturers of bronchosprometers already used in Australian hospitals, and other medical equipment.

SCHAFER AND COMPANY displayed on their stand "Dalmat" surgical supplies, "Lastonet" surgical nylon stockings, "Varicosan", "Doho" products ("Auralgan", "O-tos-mo-san", "Rhinalgan", "Rectalagan"), "Clinitest" (urine sugar analysis) and "Acetest" (ketone bodies). They also presented the new, improved "Dalmat" transparent post-operative wound dressing. This dressing is composed of a basic strong transparent film, made self-adhesive at its longitudinal margins. The mode of preparation renders it antiseptic for a long period after manufacture. The absorbent margins each side of the window have been treated so as to render them bacteriostatic. The "Dalmat" transparent wound dressing is suitable for direct application over a sutured wound without further preparation other than the removal of the protective face muslin.

SCHERING PROPRIETARY, LIMITED, featured in general the new long-acting depot hormone preparations manufactured by their principals, Schering A.G., Berlin. In particular, "Primodian" and "Primodian Depot", a combination of the male and female sex hormones in the treatment of menopausal disorders, were demonstrated. A new choleric agent entitled "Felicur" was brought to the notice of the Australian medical profession for the first time. "Felicur" chemically equals 1-phenyl-propanol and is readily absorbed and produces a strong choleric reaction when given orally. It not only produces a quantitative increase of the biliary output, but also increases its efficacy. It stimulates the liver cell itself, thus increasing the output. "Felicur" is to be used mainly for chronic and subacute diseases of the biliary duct system and in chronic inflammatory diseases of liver and gall-bladder. "Praenitron" (triethanolamine trinitrate as an additional compound), described as the modern therapy for angiospastic com-

plaints, was also featured. It was pointed out that the aim of this modern therapy was to support the heart and strengthen the blood vessels and thus reduce the frequency and severity of *angina pectoris* attacks by means of prolonged treatment. Because of its mild action and the excellent tolerance shown towards it, "Praenitron" makes possible prolonged prophylactic treatment and thereby causal therapy through provision of a steady coronary blood supply and consequent recovery of the myocardium.

H. B. SELBY AND COMPANY PROPRIETARY, LIMITED, exhibited a range of equipment of their own and various overseas firms' manufacture. Their own products include glassware, laboratory metal ware, analytical weights, heating equipment, laboratory furniture and laboratory fittings. Equipment from overseas firms included the following: The "Colpo" microscope, models "Zetopan" and "Neozet" research microscopes, the model "MeF" universal camera microscope and microtomes, from Optische Werke, C. Reichert, Austria; the automatic tissue processor, from Elliotts (Liverpool), Limited, England; the model "C" colorimeter, model 4100 flame photometer and other items from Beckman Instruments, Incorporated, California, United States of America, as well as ultracentrifuges and apparatus for paper electrophoresis and electrophoresis-diffusion, from the Spinco Division of the same firm; a flame photometer and a universal colorimeter from B. Lange, Germany; the "Selecta" and other analytical balances, microtomes and membrane filters from Sartorius Werke, Germany; basal metabolism apparatus from Warren E. Collins, Incorporated, Boston, United States of America; electrocardiographs and an electrohamoscope from Fritz Hellige and Company, Germany; a blood cell suspension mixer and the BST/L electric cleaner from Matburn, Limited, England; high vacuum equipment and plant—rotary oil pumps and accessories—as well as other specialized plant from W. Edwards and Company, England.

SIGMA COMPANY, LIMITED, had their stands decorated with the company's ethical products colour scheme—buff and green. On display were photographs illustrating some of the Sigma laboratory and manufacturing processes. As many penicillin and other antibiotic preparations were on display, a photograph of the late Professor Sir Alexander Fleming was included as a tribute. Among the range of penicillin preparations were the Sigma plastic puffer "Insufflator" packs of powder formulations for topical application. A range of newer broad-spectrum antibiotics, as well as cortisone and hydrocortisone preparations, was also displayed.

Among the various products displayed were the following: "Cilicaine Suspension", a stabilized buffered suspension containing 300,000 units of microfine procaine penicillin per millilitre; "Duocillin" (*Insufflatio Penicillini A.P.F.*, 1955), an absorbable penicillin insufflation for intra-abdominal and/or topical use; "Penacetam", an ophthalmic ointment providing synergistic action of penicillin and sulphacetamide; "Benzopen" lozenges, containing penicillin and benzocaine for painful mouth and throat infections; "Penicrin", penicillin with aminacrine in ointment and powder formulations; "Cortic" tablets, each containing 25 milligrammes of cortisone acetate; "Hexavita", orange-flavoured six-vitamin concentrate including vitamin B<sub>12</sub>; "Siguent Hycor", 1% hydrocortisone acetate ointment; "Siguent" neomycin, for extensive topical antibiosis with minimum sensitization; "Siguent" ophthalmic bacitracin-neomycin, broad-spectrum antibiotic for ophthalmology; "Somnone" capsules, capsulated chloral hydrate for oral administration; "Dactil with Phenobarb" capsules, a visceral tonic to restore and maintain normal muscle tone, abolishing pain and spasm without interference with normal tone and motility, and possessing a high degree of specificity for the smooth muscle of the upper part of the gastro-intestinal tract; "Sacchar 12" tablets, non-carbohydrate sweetening agent with added vitamin B<sub>12</sub>, to assist correct utilization and metabolism of carbohydrates and fats; "Neophyll", topical chlorophyll extract for burns, slow healing lesions, *otitis media*, *et cetera*.

SOLUS SCHALL X-RAY COMPANY, LIMITED, occupied stand 73. They are sole Australian representatives for the following British companies: General Radiological, Limited, Solus Schall, Limited, Solus Electronic Tubes, Limited, Remploy, Limited.

E. R. SQUIBB AND SONS had an L-shaped stand of modern trend. The four panels featured were brought out from England specially for the exhibition. Three of them depicted "Raudixin", "Graneodin" and "Tolseram". "Raudixin", the standardized whole root preparation of *Rauwolfia serpentina*, attracted most interest. The tendency overseas seems to favour the whole root preparations. This product is available in 50-milligramme coated tablets, packed in bottles of 50, 100 and 1000. "Graneodin", the topical application for superficial bacterial infections of the skin, eye and external ear, whether due to Gram-positive or Gram-negative organisms, is a combination of two antibiotics, neomycin and gramicidin, which are not used systemically, to avoid the danger of sensitivity. "Graneodin" is available in packs of 3.6 grammes for ophthalmic and topical use, and in the normal pack of 15 grammes for dermatological use. During the Congress, "Graneodin Lozenges" were also announced; these are indicated in mouth and throat infections. Neomycin and gramicidin are again used in combination with 10 milligrammes of benzocaine. The lozenges have a raspberry flavour and are put up in tubes of 12. "Tolseram", mephenesin carbamate, is a muscle relaxant for muscle spasm; it has greater absorption, more prolonged action and greater effectiveness than the parent compound. It is available in tablets of 0.5 gramme, in bottles containing 25 and 100. The tablets are tasteless and have undergone extensive trials in England in the fields of rheumatic diseases, neurological conditions and spasticity. "Steclin" (tetracycline hydrochloride Squibb) is now available in tablet form, and included on the P.B.A. list of drugs, in all three strengths—50, 100 and 250 milligrammes. The principal advantages of "Steclin" are stated to be as follows: it has a broad antimicrobial spectrum, few gastrointestinal side effects, effective blood levels, rapid diffusion into tissues and body fluids, and stability in blood serum, and is sometimes effective in infections resistant to certain other antibiotics. "Quinolol" and "Pronestyl" are two other Squibb products. "Quinolol" is an effective antiseptic ointment for *syccosis barbae*, despite the advent of the antibiotics. "Pronestyl" (procaine amide) is also freely available again in oral form (0.25 milligramme tablets) and injectable form (vials of 10 cubic centimetres). "Pronestyl" exhibits many advantages over procaine and quinidine, chiefly in ventricular tachycardia, as well as in ventricular and auricular arrhythmias.

THE STANFORD X-RAY COMPANY'S exhibit comprised X-ray, electro-medical, microscopic and photomicrographic equipment, of both Australian and overseas manufacture. The Stanford mobile X-ray unit, model 90/30, with a definite output of 90 kilovolts at 30 milliamperes, was demonstrated as a satisfactory mobile unit for hospitals and for general work. Another exhibit was the Siemens multileaf coning device and the Leibel-Flarsheim short-wave therapy unit. This latter unit and the Siemens "Ultratherm" are the only short-wave units that are frequency controlled, which means that no shielding will be required under the coming television regulations. The "Super Hanalux" theatre lamp was of interest to surgeons. This lamp gives satisfactory illumination for operating theatres. The physiotherapy equipment of Stanford X-Ray Company and of Siemens created considerable interest, particularly the Siemens ultrasonic apparatus. Detailed catalogues of Tracerlab, America, who are specialists in isotopes, tracer elements, related accessories, such as radiation survey meters, auto-scalers *et cetera*, were also displayed. Demonstrations were given of the Leitz Prado projector, which gives true renditions of colour transparencies with sharpness of the outer edges and is capable of being used under daylight conditions. Microscopes and photomicrographic equipment including the "Leitz Leica" "f" and "M" cameras were demonstrated. One piece of

equipment shown was the "Leitz Ortholux" research microscope fitted with phase contrast objectives and binocular photographic head, with the "Leica" camera for photomicrographic work. This unit is outstanding in its research applications. Demonstrations of the new "Laborlux III" research microscope and the "Leitz Greenough" stereoscopic microscope were also given.

FREDERICK STEARNS AND COMPANY DIVISION OF STERLING DRUG INCORPORATED, SYDNEY, AUSTRALIA, occupied stand number 7. Their exhibit comprised a group of their products designed to show their contribution to medicine. The products were set out on contemporary display units to facilitate examination. "Alevaire", an inhalant detergent which liquefies pulmonary secretions, was shown. This mucolytic solvent, which is administered as a fine spray, introduces a new field of therapy for many types of respiratory conditions due to retained secretions. "Alevaire" has proved life-saving in neonatal asphyxia, and is a useful adjunct in pulmonary complications and post-operative atelectasis. "Apolamine" is an anti-nausea agent which does not depend on one drug alone to effect relief. "Apolamine" offers measures of relief in nausea associated with pregnancy, and motion-sickness, following anaesthesia, in cholecystitis, alcoholic gastritis and radiation sickness. "Fergon" contains the organic iron salt ferrous gluconate, which has been the subject of numerous clinical reports. "Fergon" is well tolerated, well absorbed and well utilized. "Levophed" is a potent pressor hormone. It combats shock from any cause; recent reports indicate its value in shock associated with myocardial infarction. "Milbibi" vaginal suppositories are a new agent with a high cure ratio in resistant leucorrhoea. "Mycardol" is a new long-acting coronary vasodilator for prophylaxis in *angina pectoris*. Owing to the drug's low toxicity and lack of side effects, British authorities have advocated a divided daily dose of 180 milligrammes. "Mycardol" is available free as a P.B.A. item. "Neo-Synephrine", a vasoconstrictor, was exhibited with nine intranasal dosage forms. The value of "Neo-Synephrine" in four other fields was briefly outlined by a display of parenteral, ophthalmic, oral and rectal packs. "Telepaque", used for radiological visualization of the gall-bladder, was also shown. The final product shown was "Zalkon" brand of benzalkonium chloride (refined), a powerful, all-purpose germicide with a wide field of usefulness in gynaecology, obstetrics, surgery and instrument sterilization. This antiseptic is available in three concentrations—10%, one in 1000 and tincture.

SWIFT AND COMPANY, LIMITED, as exclusive agents in Australia and New Zealand for Atomic Energy of Canada Limited, exhibited at stand number 77 the following quarter-scale models of cobalt 60 beam therapy units: "Eldorado Unit" (Model A) is complete with variable treatment-distance and diaphragm assembly. (Pin and arc, blackpointer and treatment cone are available as accessory equipment.) It is designed to accommodate sources giving over 100r per minute, at one metre in air. "Theratron Unit" (Model B) is complete with adjustable diaphragm. It is designed to accommodate sources giving up to 40r per minute, at one metre in air. Sources for the "Eldorado" unit (Model A) and "Theratron Unit" (Model B) are delivered under guaranteed conditions as to replacement of partially decayed sources. "Theratron Junior" (Model C) is designed to house cobalt 60 sources in the hectocurie range and for use at medium treatment distances (35 to 65 centimetres). Multiportal and rotational features are incorporated. The source used approximates 600 curies of cobalt 60, output about 10r per minute at one metre or about 40r per minute at 50 centimetres in air. The diameter of the source is 1.5 centimetres. There have been more than 40 installations of "Eldorado" (A) and "Theratron" (B) units in the United States of America, Canada, South America, the United Kingdom and Europe. A contract has been entered into for the supply and installation of an "Eldorado Unit" (Model A) with source in New Zealand. A number of "Theratron Junior" units have also been contracted for in North America and Europe. Mr. W. J. Green, sales engineer and export sales

manager of Atomic Energy of Canada, Limited, made a special visit to Australia and New Zealand in connexion with the Australasian Medical Congress, to give first-hand information to the medical profession.

WILLIAM R. WARNER AND COMPANY PROPRIETARY, LIMITED, occupied stand number 81. The stand's main feature consisted of a prefabricated centrepiece some eight feet wide by eight feet high, comprising two sections with the company's various product names suspended in between, and these were illuminated through their extremities by ultra-violet rays. A large black recessed panel was situated on either half of this stand and had product information illustrated in light-sensitive paint activated by the invisible ultra-violet rays. A number of products were shown, including several new items such as "Tedral", "Urolucosil", "Proloid" and "Peritrate".

WATSON VICTOR, LIMITED, showed the following items: "Tubegauz", a new technique in bandaging which reduces time and cost and increases efficiency; the "Vacuum Extractor", to aid delivery in birth; "Konrad 8", the latest in portable X-ray equipment; the "Isolette" baby incubator, used by many teaching hospitals in the United States of America; theatre lamps made in Australia to the design of the American Sterilizer Company of the United States of America; "De Luxe" operating lamps; doctors' bags, made from overseas designs to suit Australian conditions; progressive treatment apparatus (with a demonstration on the oscilloscope screen of the actual wave formation of stimuli, as provided by the "Multitone" equipment); microscopes by Watson, London; a range of vitallium made available from the manufacturer "Austenal"; the "Visual Stereoscopic Anatomical Atlas"; ultra-violet therapy apparatus, with the "Hanovia Dromayer"; the "Drinite" enuresis apparatus; the "Hemometer", a new item; the "Qualtex" dry heat sterilizer; the periodical *Medicine Illustrated*; the A.C.M.I. range; the Mettler

balance, the latest in modern balances, accurate and time-saving, of the single pan type; the Skeogh eye magnet (a Newton Victor product), an eye magnet with remarkable power; astronomical telescopes and allied lines such as binoculars and magnifiers; the "Electrocator" for minor electro-surgery—a high-frequency unit; the "Rota-frame", the new method of nursing immobile patients; the Galfie cautery and light unit, with a new principle of foot-operated control. Also were shown autoclaves, diagnostic lamps, bandages, scales, infra-red, short-wave, ultrasonic and deep and superficial X-ray therapy equipment, a complete range of surgical instruments and diagnostic X-ray equipment.

WYETH INTERNATIONAL, LIMITED, occupied stand number 29. The principal feature was "The House of Wyeth", a complete unit displaying colourful reproductions of "Osler at Old Blockley", "Conquerors of Yellow Fever", "The Dawn of Abdominal Surgery", "Beaumont and Saint Martin", and two reprints, one of Chelsea Hospital and the other of Surrey Institution. Amongst the products exhibited were "Amphojel", "Amphotabs", "Petrolagar", "Kaomagma", "Feromax", "Propion Gel", "Purodigin" and "Wiadase". "Penidural All-Purpose" (1.2 mega units) was also shown; this is a long-acting triple penicillin compound providing as one injection 0.3 mega unit each of potassium and procaine penicillin, together with 0.6 mega unit of "Benzathine Penicillin G", a new penicillin salt evolved by the Wyeth Institute of Biological Research. "Thiomerin" provides a humane approach to diuresis; it is a mercurial diuretic for subcutaneous administration, and is safe and effective. "Rubiguent", known in England as "Algipan", is a new and powerful unguent containing histamine and methyl nicotinate. "Aludrox" suspension and tablets are a palatable mixture of aluminium hydroxide and milk of magnesia, designed for the peptic ulcer patient prone to constipation.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED OCTOBER 1, 1955.<sup>1</sup>

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory.	Australian Capital Territory.	Australia.
Acute Rheumatism .. ..	2(1)	1(1)	3(2)	..	5(5)	..	..	..	11
Amoebiasis .. .. .	..	..	..	..	..	..	..	..	..
Ancylostomiasis .. ..	1	..	1	..	..	..	..	..	2
Anthrax .. .. .	..	..	..	..	..	..	..	..	..
Bilharziasis .. .. .	..	..	..	..	..	..	..	..	..
Brucellosis .. .. .	..	1(1)	..	..	..	..	..	..	1
Cholera .. .. .	..	..	..	..	..	..	..	..	..
Chorea (St. Vitus) .. ..	..	..	..	..	..	..	..	..	..
Dengue .. .. .	..	..	..	..	..	..	..	..	..
Diarrhoea (Infantile) ..	7	17(12)	10(4)	..	..	..	..	1	35
Diphtheria .. .. .	1	..	1	..	8(8)	..	..	..	10
Dysentery (Bacillary) ..	..	..	..	..	..	..	..	..	..
Encephalitis .. .. .	1	..	..	5(5)	..	..	..	..	6
Filariasis .. .. .	..	..	..	..	..	..	..	..	..
Homologous Serum Jaundice	..	..	..	..	..	..	..	..	..
Hydatid .. .. .	..	..	..	..	..	..	..	..	..
Infective Hepatitis .. ..	38(26)	67(35)	..	9(3)	2(1)	1	..	..	117
Lead Poisoning .. .. .	..	..	1	..	..	..	..	..	1
Leprosy .. .. .	..	..	..	..	..	..	..	..	..
Leptospirosis .. .. .	..	..	..	..	..	..	..	..	..
Malaria .. .. .	..	..	..	..	..	..	..	..	..
Meningococcal Infection	..	4(2)	..	..	..	..	..	..	4
Ophthalmia .. .. .	..	..	..	..	..	..	..	..	..
Ornithosis .. .. .	..	..	..	..	..	..	..	..	..
Paratyphoid .. .. .	..	..	..	..	..	..	..	..	..
Plague .. .. .	..	..	..	..	..	..	..	..	..
Polioomyelitis .. .. .	1	2(1)	..	5(5)	..	..	..	..	8
Puerperal Fever .. .. .	..	..	..	..	..	..	..	..	..
Rubella .. .. .	..	54(37)	..	4(3)	2(1)	..	..	..	60
Salmonella Infection ..	..	..	..	..	..	..	..	..	..
Scarlet Fever .. .. .	13(10)	8(7)	14(7)	12(8)	..	..	..	..	47
Smallpox .. .. .	..	..	..	..	..	..	..	..	..
Tetanus .. .. .	..	..	..	..	7(1)	..	..	..	7
Trachoma .. .. .	..	..	..	..	..	..	..	..	..
Trichinosis .. .. .	..	..	..	..	..	..	..	..	..
Tuberculosis .. .. .	34(18)	20(16)	10(3)	8(7)	6(4)	3	..	..	81
Typhoid Fever .. .. .	1(1)	..	..	..	1(1)	..	..	..	2
Typhus (Flea-, Mite- and Tick-borne)	..	..	3	..	1(1)	..	..	..	4
Typhus (Louse-borne) ..	..	..	..	..	..	..	..	..	..
Yellow Fever .. .. .	..	..	..	..	..	..	..	..	..

<sup>1</sup> Figures in parentheses are those for the metropolitan area.



## Naval, Military and Air Force.

### APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Numbers 44, 46 and 47, of September 15, 22 and 29, 1955.

#### NAVAL FORCES OF THE COMMONWEALTH.

##### Permanent Naval Forces of the Commonwealth (Sea-Going Forces).

**Fixing Rates of Pay.**—Surgeon Lieutenant (for Short Service) Stephen John Lloyd is paid the rates of pay and allowances prescribed for Surgeon Lieutenant-Commander, whilst acting in that rank, dated 5th January, 1955.

**Termination of Appointment.**—The appointment of Edward Henry Roffey as Surgeon Lieutenant (for Short Service) is terminated, dated 26th August, 1955.

##### Citizen Naval Forces of the Commonwealth.

###### Royal Australian Naval Reserve.

**Appointments.**—John Francis Kemp is appointed Surgeon Lieutenant, dated 23rd June, 1955. John Hunter Stephenson is appointed Surgeon Lieutenant, with seniority in rank of 2nd March, 1953, dated 2nd March, 1955.

**Confirmation in Rank.**—Surgeon Lieutenants (on probation) Frederick Arthur Stenning and Desmond Albert Cooper are confirmed in the rank of Surgeon Lieutenant, with seniority in rank of 4th May, 1950, and 9th October, 1950, respectively.

#### AUSTRALIAN MILITARY FORCES.

##### Australian Regular Army.

###### Royal Australian Army Medical Corps.

The Short Service Commissions granted to the following officers are extended until the dates indicated: Captains (Temporary Majors) 3/40055 G. A. Scott, 30th June, 1956, and 3/40123 A. P. Hanway, 30th September, 1956.

##### Citizen Military Forces.

###### Southern Command.

**Royal Australian Army Medical Corps (Medical).**—The following officers are appointed from the Reserve of Officers and to be Captains (provisionally), 10th July, 1955: Honorary Captains 3/101031 R. C. W. Williams and 3/101030 J. D. H. Muir.

3/101024 Captain (provisionally) G. R. Stirling relinquishes the provisional rank of Captain and is transferred to the Reserve of Officers (Royal Australian Army Medical Corps (Medical)) (Southern Command) in the honorary rank of Captain, 1st July, 1955. To be Captains (provisionally), 15th August, 1955: 3/101028 David More O'Sullivan and 3/101029 John Maurice Court.

###### Tasmania Command.

**Royal Australian Army Medical Corps (Medical).**—To be Lieutenant-Colonel, 1st July, 1955: 6/15385 Major (Temporary Lieutenant-Colonel) L. N. Gollan.

##### Reserve Citizen Military Forces.

###### Royal Australian Army Medical Corps.

**Northern Command.**—To be Honorary Captains: Ronald Bruce Cross, 12th August, 1955, and Lorna Boyd, 15th August, 1955.

Honorary Captain N. O. Denning is retired, 12th July, 1955.

#### ROYAL AUSTRALIAN AIR FORCE.

##### Air Force Reserve: Medical Branch.

The following Air Cadets are appointed to a commission, provisionally, 15th June, 1955, with the rank of Pilot Officer: Maxwell Melrose Harvey (015223), Rodney Alexander Watkins (015228), Lionel Geoffrey Lukin (015224), Stanley Rowland Duke (015222), William Alexander Joseph Campbell (015220), Edgar Joseph Ahern (015217).

The provisional appointment of the following Pilot Officers is confirmed and they are promoted to the rank of Flight Lieutenant: S. J. H. Shepherd (034703), 19th December, 1953; G. B. Philip (023626), 16th June, 1954; R. J. McArthur

(023646), M. F. Shellshear (024134), R. M. Hart (024313), 26th January, 1955; F. L. Johnson (0211513), F. Ehrlich (0211517), 30th April, 1955; J. D. Bowdler (024123), 14th June, 1955.

Flight Lieutenant C. G. Wilson (277533) is promoted to the temporary rank of Squadron Leader, 30th July, 1955.

## Post-Graduate Work.

### THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

#### Courses for Part II of D.G.O., D.L.O. and D.O.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that courses for Part II of the diplomas in gynaecology and obstetrics, in otorhino-laryngology and in ophthalmology will begin on November 28, 1955, for a period of three months with a vacation about the end of the year. Those interested in attending these courses are requested to communicate with the Course Secretary of the Post-Graduate Committee in Medicine, 131 Macquarie Street, Sydney, at the earliest date. Telephones: BU 4497-8.

## Diary for the Month.

OCT. 25.—New South Wales Branch, B.M.A.: Ethics Committee.

OCT. 26.—Victorian Branch, B.M.A.: Branch Council.

OCT. 29.—New South Wales Branch, B.M.A.: Branch Meeting (Wagga Wagga).

## Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

**New South Wales Branch** (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

**Queensland Branch** (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

**South Australian Branch** (Honorary Secretary, 80 Brougham Place, North Adelaide): All contract practice appointments in South Australia.

**Western Australian Branch** (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all contract practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

## Editorial Notices.

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